NORTH SLOPE
SUBAREA CONTINGENCY PLAN

SENSITIVE AREAS
SECTION

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INTRODUCTION

This section is intended for use by the On-Scene Coordinators during the initial phase of a spill event to assist in ascertaining the location and presence of spill-sensitive biological and cultural resources, services and users in the North Slope Subarea. This information is specific to the North Slope. No attempt has been made to duplicate information contained in easily accessible existing documents. This section, therefore, must be used in conjunction with the referenced materials and informational contacts identified herein. More detailed and current data should be available from on-scene resource experts when they become engaged in the response. This information is geared toward early response. If appropriate, natural resources trustees may be conducting natural resource damage assessment (NRDA) activities in conjunction with response activities. Information regarding NRDA activities should be directed to the natural resources trustees or to their appointed NRDA Liaison.

Often, the most detailed, up-to-date biological and resource use information will come from people who live and work in the impacted area. People from the local community are often knowledgeable sources for information related to fishing, hunting, non-consumptive outdoor sports, and subsistence use. They may also have a good idea of which spill response techniques (especially exclusion and diversion booming) are practicable under prevailing weather and current conditions.

The Alaska Regional Response Team (ARRT) has adopted several documents (see the *Alaska Federal/State Contingency Plan for Response to Oil & Hazardous Substance Discharges/Releases (Unified Plan)* that address decision making to help protect sensitive areas and resources. These documents (and their location) include:

- ARRT Oil Dispersant Guidelines for Alaska (see *Unified Plan* Annex F, Appendix 1)
- *In Situ* Burning Guidelines for Alaska (see *Unified Plan* Annex F, Appendix 2)
- Wildlife Protection Guidelines for Alaska (see *Unified Plan* Annex G, Appendix 1)
- Alaska Implementation Guidelines for Federal OSCs for the Programmatic Agreement on Protection of Historic Properties during Emergency Response under the National Oil and Hazardous Substances Pollution Contingency Plan Protection of Historic Properties (see *Unified Plan* Annex M)

In addition, Federal OSCs in Alaska are working in cooperation with the U.S. Department of the Interior and the National Marine Fisheries Service to ensure response activities are conducted meet Endangered Species Act requirements, in accordance with the 2001 *Inter-Agency Memorandum of Agreement Regarding Oil Spill Planning and Response Activities Under the Federal Water Pollution Control Act National Oil and Hazardous Substances Pollution Contingency Plan* (see *Unified Plan* Annex K).

In addition, Annex N of the *Unified Plan* includes *Shoreline Cleanup and Assessment Guidelines*, which provide helpful information on clean-up options by shoreline type.

Section G of the Subarea Contingency Plan contains site-specific Geographic Response Strategies (GRSs) for use by responders in protecting key sensitive areas. In addition, Environmental Sensitivity Index (ESI) maps have been produced that illustrate selected sensitive resources and shoreline types.

This section and the guidelines in the *Unified Plan* are also intended for use by facility/vessel operators in developing industry oil spill prevention and contingency plans. For an operator's facility or area of

operation, industry contingency plans describe: (a) environmentally sensitive areas and areas of public concern; (b) how sensitive areas would be prioritized during a spill event; and (c) response strategies to protect sensitive areas at risk. The information in industry plans should be consistent with subarea plans.

The definition of sensitive resources and their geographic locations requires use of field observations and data available from published and non-published materials or through additional field work. With the limited time and funds available for Subarea Contingency Plan development (there are ten such plans covering the state of Alaska), not all the detailed information necessary to adequately complete the Sensitive Areas Section was compiled. Identifying relative priorities among resources and resource uses takes considerable coordination and discussion among resource management agencies. Plans are being developed to further conduct information gathering, compilation, prioritization, and presentation to add to the information required in this section for the next update.

In January 2010, Audubon Alaska, in cooperation with Oceana, published the *Arctic Marine Synthesis Atlas of the Chukchi and Beaufort Seas*. This information is incorporated with the permission of Audubon Alaska.

The Alaska Clean Seas (ACS) *ACS Technical Manual: Map Atlas* includes detailed maps of the coastal area between the Kogru and Canning Rivers. The Atlas identifies sensitive areas and prescribes response tactics for selected areas. The ACS material was developed with input from federal and state and local agencies. This information is incorporated, by reference, into this section (with the permission of ACS). See the Geographic Response Strategies Section for a quick-reference guide to the *ACS Technical Manual*. In the electronic version of this plan, hyperlinks are provided for ready access to the contents of the *ACS Technical Manual*.

Many of the maps presented in this section are available on-line through the Internet at:

http://www.asgdc.state.ak.us/maps/cplans/subareas.html

Suggestions, comments, and more current information are requested. Please contact either:

Doug Mutter
Department of the Interior
Office of Environmental Policy
and Compliance
1689 C Street, Room 119
Anchorage, Alaska 99501
271-5011
FAX 271-4102
email: douglas_mutter@ios.doi.gov

Jack Winters
Alaska Department of Fish and Game
Habitat Division
1300 College Road
Fairbanks, Alaska 99701
459-7285
FAX 459-7303
email: jack.winters@alaska.gov

SENSITIVE AREAS: PART ONE – INFORMATION SOURCES

Agency	Resources	Point of Contact
FISH AND WILDLIFE AND HABITAT RESOURCES		
Alaska Department of Fish and Game	fish, shellfish, birds, terrestrial mammals, marine mammals	Division of Habitat Fairbanks 907-459-7285
U.S. Department of the Interior	migratory birds, sea otters, polar bears, walrus, endangered species, anadromous fish in freshwater, bald eagles, wetlands	Office of Environmental Policy & Compliance Anchorage 907-271-5011
U.S. Department of Commerce, National Marine Fisheries Service	sea lions, seals, whales, endangered marine species and listed anadromous fish in marine waters	Protected Resources Division Anchorage 907-271-5006
U.S. Department of Commerce, National Marine Fisheries Service	essential fish habitat	Habitat Conservation Division Anchorage 907-271-5006
U.S. Department of Commerce, National Marine Fisheries Service	effects of oil on fisheries resources, hydrocarbon chemistry, dispersants	Alaska Fisheries Science Center Auke Bay Laboratory 907-789-6000
University of Alaska	rare and endangered plants	Alaska Natural Heritage Program Anchorage 907-257-2785
CULTURAL AND ARCHAEOLOGICAL SITES		
Alaska Department of Natural Resources	historic sites, archaeological sites, national register sites	Alaska Office of History and Archaeology Anchorage 907-269-8721
U.S. Department of the Interior	archaeological/historical sites in park and wildlife refuge system units, public lands, Native allotments/trust lands; sunken vessels	Office of Environmental Policy & Compliance Anchorage 907-271-5011
SHORELINE TYPES		
U.S. Department of Commerce, National Oceanic & Atmospheric Administration	shoreline types, environmental sensitivity index maps	Scientific Support Coordinator Anchorage 907-271-3593

Agency	Resources	Point of Contact
LAND OWNERSHIP AND CLASSIFICATIONS/DESIGNATIONS		
Alaska Department of Natural Resources	state lands, state parks and recreation areas, state forests, tidelands	Division of Mining, Land, and Water Anchorage 907-269-8565
Alaska Department of Fish and Game	state game refuges, state critical habitats	Division of Habitat Fairbanks 907-459-7285
U.S. Department of the Interior	national parks and preserves, national historic sites, national monuments, national wildlife refuges, public lands, national recreation areas, wild and scenic rivers, wilderness areas, Native trust lands	Office of Environmental Policy & Compliance Anchorage 907-271-5011
U.S. Department of Defense	military installations and reservations	Alaska Command Anchorage 907-552-3944
Local Governments: – North Slope Borough	municipal and private lands, and rights-of-way coastal program special areas, plans, policies	For the current local government contact information, go to B. Resources Section, Part One Community Profiles For the current tribal contact information, go to B. Resources Section, Part Three Information Directory, Native Organizations and Federally Recognized Tribes
COMMERCIAL HARVEST		
Alaska Department of Fish and Game	fishing permits, seasons	Commercial Fisheries Division Fairbanks 907- 459-7387
Alaska Department of Natural Resources	tideland leases	Division of Mining, Land, and Water Anchorage 907-269-8565
Alaska Department of Environmental Conservation	seafood processing	Division of Environmental Health Juneau 907-269-7644
U.S. Department of Commerce National Marine Fisheries Service	fishing permits, seasons	Protected Resources Division Anchorage 907-271-5006

Agency	Resources	Point of Contact
SUBSISTENCE, PERSONAL, AND SPORT USES		
Alaska Department of Fish and Game	subsistence and personal uses statewide and navigable waters, sport hunting and fishing	Sport Fish Division Fairbanks 907-459-7388
U.S. Department of the Interior	subsistence uses on Federal lands and reserved waters; subsistence uses of: sea otters and migratory birds	Office of Environmental Policy & Compliance, Anchorage 907-271-5011
U.S. Department of Commerce	subsistence use of: whales, porpoises, seals, sea lions	Protected Resources Division Anchorage 907-271-5006
North Slope Borough	subsistence activities	Department of Wildlife Management Barrow 907-852-0350
RECREATION AND TOURISM USES		
Alaska Department of Natural Resources	State parks and recreation areas, anchorages, boat launches, campgrounds, State public lands	Division of Parks and Outdoor Recreation Fairbanks 907-451-2695
Alaska Department of Fish and Game	sport hunting and fishing	Division of Habitat Fairbanks 907-459-7285
Alaska Department of Commerce, Community & Economic Development	seasonal events and activities, travel, outdoor activities, local visitor bureaus, tourism industries	Alaska Office of Tourism Development Juneau 907-465-5478
U.S. Department of the Interior	recreation uses in park and wildlife refuge system units and Federal public lands	Office of Environmental Policy & Compliance, Anchorage 907-271-5011
WATER INTAKE AND USE FACILITIES		
Alaska Department of Environmental Conservation	public drinking water wells, treatment, and storage, fish processing facilities	Division of Water Anchorage 907-269-7601
Alaska Department of Fish and Game	hatcheries, ocean net pens and release sites, aquaculture	Division of Habitat Fairbanks 907-459-7285

Agency	Resources	Point of Contact
Alaska Department of Natural Resources	tidelands leases, aquaculture sites, private logging camps and log transfer facilities	Division of Mining, Land, and Water Juneau 907-465-3400
U.S. Coast Guard	marinas and docks, mooring buoys	Sector Anchorage Anchorage 907-271-6700

PART TWO – AREAS OF ENVIRONMENTAL CONCERN

A. BACKGROUND/CRITERIA

The following relative priority listing was developed by the Sensitive Areas Work Group, with representatives from State and Federal agencies and the private sector. The list prioritizes resources into designations of major, moderate, and lesser concern. Resources are not prioritized within each designation. These designations are for consideration in initial spill response activities, they are not applicable to extended clean-up activities. This prioritization scheme must be used in conjunction with spill-specific information (e.g., size and location of spill, type of product, trajectory) to determine the actual protection priorities for that discharge.

The following criteria were developed as a tool to establish levels of concern. These criteria are not listed in a priority order.

CRITERIA FOR RELATIVE PRIORITY RATING

- human economic disruption -- economic/social value; human food source disruption
- mortality -- wildlife, fish, other organisms (how many potentially killed in relation to abundance)
- animal displacement and sensitivity to displacement
- aesthetic degradation
- habitat availability and rarity
- sublethal effects, including sensitivity to physical or toxic effects of oil or hazardous substances and long-term affects to habitat, species, or both
- threatened and endangered species, and/or other legal designation
- persistent concentration of oil or hazardous substances
- reproduction rate or recolonizing potential
- relative importance to ecosystem
- potential for physical contact with spill--pathway of oil or hazardous substances
- resource sensitivity to response countermeasures

B. AREAS OF MAJOR CONCERN

Shoreline Geomorphology - Coastal Habitat Types:
- River deltas
- Sheltered lagoons
- Open lagoons
- Salt marshes
- Mud flats
- Barrier islands
- Spit beaches
- Protected bays

Inland Habitat Types:
- Riparian willow
- Connected lakes
- Freshwater springs
- Deep lakes

Recurring Leads and Polynyas in Sea Ice

Threatened or Endangered Species Habitat
- Polar Bear Critical Habitat]
- Spectacled Eider Critical Habitat

Spotted Seal Haulout Areas (> 10 animals)

Ringed Seal Lairs and Pupping Areas

Walrus Haulout Areas

Beluga Whale Concentration Areas

Bowhead Whale Nearshore Migration Routes

Polar Bear Denning and Feeding Areas

Bear Concentration Areas (marine mammal/carcasses; salmon)

Caribou Calving and Insect Relief Areas

Large Seabird Colonies (> 100 birds)

Waterfowl and Shorebird Spring and Fall Concentration and Staging Areas

Waterfowl Molting Concentration Areas

Anadromous Fish Spawning and/or Rearing Streams (i.e., salmon, Dolly Varden, whitefish)

Land Management Designations:
- Federal:Wilderness and Wilderness Study Areas
  - Wild and Scenic Rivers
  - National Natural Landmarks
  - Research Natural Areas (Toolik Lake, Galbraith Lake)
  - Specially Designated Areas

Cultural Resources/Archaeological Sites:
- National Historic Landmarks
- Burial Sites
- National Register Eligible Village Sites
- Intertidal Sites

Subsistence Harvest Areas

High Commercial Use Areas

High Recreational Use Areas

River Floodplains

C. AREAS OF MODERATE CONCERN

Shoreline Geomorphology - Coastal Habitat Types:
- Beaded tundra streams

Upland Habitat Types:
- Drained lake basins

Spotted Seal Haulout Areas (< 10 animals)
Ringed Seal Shorefast Ice Concentration Areas
Seabird Colonies (10 - 100 birds)
Waterfowl and Shorebird Nesting Concentration Areas
Shorebird Molting Concentration Areas
Polar Bear General Distribution
Walrus General Distribution
Caribou Migration Routes
Muskox Riparian Habitat
Commercial Harvest Areas
Recreational Use Areas
Land Management Designations:
- Federal: National Parks
  National Wildlife Refuges

Cultural Resources/Archaeological Sites:
- National Register Eligible Sites (Other Than Village Sites)
- Sites Adjacent To Shorelines

D. AREAS OF LESSER CONCERN

Upland Habitat Types:
- Mesic/dry tussock tundra
- Alpine tundra

Bearded Seal General Distribution
Gray Whale Nearshore Migration and Feeding Areas
Seabird Colonies (< 10 birds)
Waterfowl and Shorebird General Distribution
General Freshwater Fish Habitat
Land Management Designations:
- Federal: Public Lands
  National Preserves
- State: General Public Lands

E. AREAS OF LOCAL CONCERN

The North Slope Borough, in their Coastal Management Plan, has identified Areas Meriting Special Attention based on unique ecological, recreational, cultural, geophysical, or developmental values.

1. Cape Thompson Area Meriting Special Attention

The seacliffs of this area provide essential nesting habitat for 9 species of raptors and ravens, and one of the largest concentrations of murres and kittiwakes in the eastern Chukchi Sea. This is one of the northernmost seabird colonies in the U.S. Marine mammals migrate offshore, including: the bowhead

whale, gray whale, beluga whale, walruses, polar bears, and ringed, spotted and bearded seals. This area has traditionally been used as a subsistence hunting and gathering area.

2. Kasegaluk Lagoon and Barrier Island System Area Meriting Special Attention

The waters of the lagoon and the nearshore waters seaward of the barrier islands represent a high use area for beluga whales and other marine mammals. Belugas use the nearshore waters seaward of the barrier islands throughout the summer. The barrier islands and lagoon are used by shorebirds and waterfowl for spring migration, resting, nesting, feeding, molting, and fall migrations staging. This is an important subsistence use area, including egg gathering, waterfowl hunting, sealing, fishing, walrus hunting, and whaling.

PART THREE – RESOURCE SENSITIVITY

The following sensitivity tables were developed by the State and Federal Natural Resources Trustees with legislative responsibility for management and protection of these resources. This includes the following agencies: National Marine Fisheries Service, U.S. Fish and Wildlife Service, National Park Service, Bureau of Land Management, Alaska Department of Fish and Game, and Alaska Department of Natural Resources. This information is a summary derived from recent field studies, research reports, long-term monitoring, stakeholder input, and local knowledge. Periods and/or conditions when resources are of varying levels of concern (low, medium, high) with respect to affects from an oil spill are noted in the following tables.

SHORELINE GEOMORPHOLOGY

CATEGORY	LOW	MEDIUM	HIGH
COASTAL HABITAT TYPES		Beaded tundra streams	River deltas Sheltered lagoons Open lagoons Salt Marshes Barrier islands Mudflats Spit beaches Protected bays
LAKE AND RIVER HABITAT TYPES	Exposed rocky cliffs & banks Bedrock shores & ledges, rocky shoals Eroding scarps/banks in unconsolidated sediment Exposed man-made structures	Sand beaches & bars Mixed sand & gravel beaches & bars Gravel beaches & bars Gently sloping banks Exposed flats Riprap	Sheltered scarps in bedrock Vegetated steep sloping blufs Sheltered man-made structures Vegetated low banks Sheltered sand & mud & muddy substrates Marshes
UPLAND HABITAT TYPES	TO BE DEVELOPED	TO BE DEVELOPED	TO BE DEVELOPED

THREATENED OR ENDANGERED SPECIES

CATEGORY	LOW	MEDIUM	HIGH
ENDANGERED SPECIES			Bowhead whale Eskimo curlew (extinct?)
THREATENED SPECIES			Spectacled eider Steller's eider Polar bear
POTENTIAL SPECIES	Yellow-billed loon	Bristle-thighed curlew	
PROTECTED SPECIES			Bald & golden eagles, marine mammals and migratory birds

RINGED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE		pack ice	shorefast ice
SUSCEPTIBILITY		year around	
HUMAN HARVEST			year around

The shorefast ice between Cape Lisburne and Point Lay has one of the highest densities of ringed seals.

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Nearshore concentrations in shorefast ice	==========									==========		
Pupping and Weaning			=======									
Molting			==========									
Present in area	==========									==========		

BEARDED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			ice-edge
SUSCEPTIBILITY		year around	
HUMAN HARVEST			year around

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Pupping in Chukchi Sea			=========									
Present in Beaufort Sea						==========						
Present in Chukchi Sea	==========									==========		

SPOTTED SEALS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE (ON HAULOUTS)	< 10	10 - 100	> 100
SUSCEPTIBILITY		year around	
HUMAN HARVEST			May 1 - Nov 30

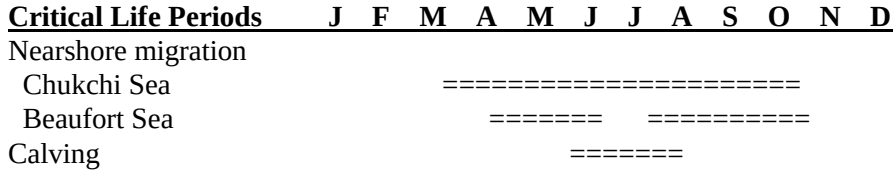
The largest known concentration of spotted seals in Alaska haulout at Kasegaluk Lagoon from mid-July until late October or early November.

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Coastal haulouts/ Concentration areas												
Chukchi Sea						==========						
Beaufort Sea						==========						

BELUGA WHALES

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE[1]	< 10	10 - 100	> 100
SUSCEPTIBILITY	Aug 1 - Mar 31	Apr 1 - May 20 (Chukchi Sea) May 15 - Aug 31 (Beaufort Sea)	May 20 - July 31 (Chukchi Sea)
HUMAN HARVEST	Sept 10-Mar 31 (Chukchi Sea) Oct 20 - July 31 (Beaufort Sea)		Apr 1 - Sept 10 (Chukchi Sea) Aug 1 - Oct 20 (Beaufort Sea)

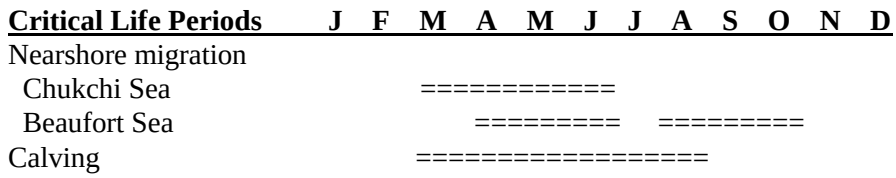
[1] Between June 20 and August 15 large numbers of Beluga whales concentrate in Kasegaluk Lagoon.



BOWHEAD WHALES

CATEGORY	LOW	MEDIUM	HIGH
SUSCEPTIBILITY	Nov 1 - Mar 20	July 1 - Oct 31 (Chukchi Sea) July 1 - July 31 (Beaufort Sea)	Mar 20 - June 30 (Chukchi Sea) Apr 15 - June 30 Aug 1 - Oct 31 (Beaufort Sea)
HUMAN HARVEST[2]	June 16 - Nov 1 (Chukchi Sea)		Apr 1 - June 15 (Chukchi Sea) Aug 1 - Oct 20 (Beaufort Sea)

[2] During the ice-covered months in the Beaufort and Chukchi seas whales are unavailable for harvest.



GRAY WHALES

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Jun 1 - Jul 31; Oct 1 - Oct 31 (Chukchi Sea) Jun 1 - Oct 31 (Beaufort Sea)	Aug 1 - Sep 30 (Chukchi Sea)	
SUSCEPTIBILITY		When Present	

Critical Life Periods **J F M A M J J A S O N D**

Nearshore migration & feeding
Chukchi Sea ==========

WALRUS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Nov 1 - May 1	May 1 - June 15 Oct 1 - Oct 31	June 15 - Sept 30
SUSCEPTIBILITY		year around	
HUMAN HARVEST	May 1 - May 15 Sep 1 - Oct 30		May 15 - Aug 20

Critical Life Periods **J F M A M J J A S O N D**

Present on haulouts or
in nearshore waters ==========

POLAR BEARS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Pack ice	Shore-fast ice and active ice areas	Denning areas during entrance/emergence; feeding areas such as leads/polynyas; coastal beaches and barrier islands
SUSCEPTIBILITY	Summer (June-August)		Fall, winter, spring (September-May)
HUMAN HARVEST	June - September (Chukchi Sea) June - August (Beaufort Sea)	October, February (Chukchi Sea) September, January - March (Beaufort Sea)	November - January, March - May (Chukchi Sea) October - December, April - May (Beaufort Sea)

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Denning of pregnant females	==========									=========		
Along or on the coastline	==========									=========		

BROWN BEARS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE			April 15 – Nov 15
SUSCEPTIBILITY	Nov 15-Apr 30		May 1 - Nov 15
HUMAN HARVEST	June 1-Aug 30		Sept 1 - May 31

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Denning	==========									=========		
Concentration associated w/ mammalian food sources			==========									
salmon streams					========							

CARIBOU

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE[3]			
SUSCEPTIBILITY	Nov 1 - Mar 15	My 15-May 20 Jne 10-June 30 Aug 15-Sep 15	May 20 - June 10 July 1 - Aug 15
HUMAN HARVEST			Year around

[3] There are four caribou herds that utilize various portions of this region. Depending on the herd and the climatic conditions; abundance may vary widely. As a result, specific abundance figures will not established for use in prioritizing the importance of an area.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Calving period					==							
Insect Relief habitat						========						
Migrations			========					=======				

MUSKOXEN

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Three groups of muskoxen reside in this region of the state. Their range is currently expanding with major concentrations occurring along the river systems. There is a declining population, particularly in the eastern group.		
SUSCEPTIBILITY		Year around	
HUMAN HARVEST	Muskoxen are harvested from the Itkillik River to the Canadian border.		

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Calving				=======								

WATERFOWL AND SHOREBIRDS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	In Prep.		
SUSCEPTIBILITY[4-9]	Oct 1 - May 15	May 15 - Jun 20	June 20 - Sept 30
HUMAN HARVEST		July 1 - Aug 15 (Chukchi Sea) July 10 - Aug 1 Oct 1 - Nov 15 (Beaufort Sea)	Apr 1 - Jun 30; Aug 15 - Sept 30 (Chukchi Sea) May 1 - Jul 10; Aug 1 - Sept 30 (Beaufort Sea)

[4] Spectacled Eider (14,25) - are in the area from Late May through Late September.

[5] Steller's Eider (26) - are concentrated in the Barrow area from early June to September.

[6] Common Eider (5,10) - nesting and brood-rearing on barrier islands from late June to mid-August.

[7] Snow geese (10,13,14,27) - brood-rearing is concentrated at Putuligayuk, Sagavanirktok, Kadleroshilik, and Shaviovik river deltas; Howe Island, and Foggy Island Bay from early July to mid-August.

[8] Brant (5,10,14) - brood-rearing is concentrated at Putuligayuk, Kuparuk and eastern Colville River deltas; mouth of East Creek to Oliktok Point from early July to mid-August.

[9] Yellow-billed loon (Inter-agency Conservation Agreement) concentrated between the Meade and Colville rivers around deep lakes from mid-May to mid-September.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Arrival/Nesting/brood rearing					==========							
Molting/feeding concentrations						======						
Fall migration							=========					

SEABIRDS

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	< 10	10 – 100	> 100
SUSCEPTIBILITY	Nov 1 - Jan 31	Feb 1 - March 31	May 1 - Sept 30
SPECIES DIVERSITY	1 - 3	4 – 6	> 6
HUMAN HARVEST[9]			May 1 - July 30

[9.] Seabird eggs utilized by Native communities from late June through July.

Most of the worlds population of Ross' Gull (8,17,18) is found in nearshore areas of the Barrow area from September through October.

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
At breeding colonies					==========							
Feeding near colonies					==========							

SALMON (pink and chum)

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Due to limited information and the finite number of fishbearing streams in the area; all anadromous fish streams in this area are considered important.		
SUSCEPTIBILITY	June 15 - Aug 1		Aug 1 - June 15
HUMAN HARVEST			June 15 - Aug 30

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Spawning							=====					
Eggs/fry in gravels	==========							==========				

DOLLY VARDEN/ARCTIC CHAR

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Due to limited information and the finite number of fishbearing streams in the area; all anadromous fish streams in this area are considered important.		
SUSCEPTIBILITY		June 16 - Sept 15	Sep 15 - June 15
HUMAN HARVEST	Oct 1 - June 15		June 16 - Sep 30

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Spawning									=======			
Overwintering	==========							==========				
Eggs/fry in stream gravels	==========							==========				
Rearing in freshwater	==========							==========				

ANADROMOUS WHITEFISH

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Limited Data are Currently Available on Fish Populations within North Slope Streams		
SUSCEPTIBILITY		June 15 - Aug 31	Sept 1 - June 15
HUMAN HARVEST			July 1 - Sept 15 Oct 1 - Nov 15

Critical Life Periods	J	F	M	A	M	J	J	A	S	O	N	D
Spawning									=======			
Overwintering	==========							==========				
Spring migration					======							
Fall migration									=======			

FRESHWATER FISH

CATEGORY	LOW	MEDIUM	HIGH
ABUNDANCE	Limited Data are Currently Available on Fish Populations in North Slope Streams		
SUSCEPTIBILITY		July 15 - Aug 31	Sept 1 - July 15
HUMAN HARVEST	Oct 1 - May 30	June 1 - Sept 30	

Critical Life Periods	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Spawning												
Spring					=======							
Fall								=======				
Overwintering	==========								==========			

LAND MANAGEMENT DESIGNATIONS

CATEGORY	LOW	MEDIUM	HIGH
FEDERAL LANDS	Public Land	National Parks Wildlife Refuges	Wild & Scenic Rivers Wilderness Areas & Study Areas National Natural Landmarks
STATE LANDS	Public Land[10]		Critical Habitats Refuges

[10] Includes submerged lands out to 3 miles and historic bays and inlets.

CULTURAL RESOURCES/ARCHAEOLOGICAL SITES

CATEGORY	LOW	MEDIUM	HIGH
CULTURAL AND ARCHAEOLOGICAL SITES	Cultural Resources that do not meet National Register criteria	National Register eligible sites (excluding villages sites) Sites adjacent to shorelines	National Historical Landmarks National Natural Landmarks Burial sites National Register eligible village sites Intertidal sites

PART FOUR – BIOLOGICAL AND HUMAN USE RESOURCES

A. INTRODUCTION

The background information contained in this section is a mixture of references to readily available documents, knowledgeable contacts, and data not readily available elsewhere. Several industry-generated references that have had agency input and review are incorporated by reference.

a. See Alaska Clean Seas' *Alaskan Beaufort Sea Coastal Region: Volume I. Oil Spill Response Considerations Manual* and *Volume II. Biological Resources Atlas* (1983). This report includes narrative and maps covering the coast from Point Barrow east to Demarcation Bay. Information covers:

(1) Shoreline geomorphology
(2) Coastal processes
(3) Biological resources
--birds
--fish
--terrestrial mammals
--marine mammals
(4) Oil spill response considerations
(5) Socio-cultural resources

b. See Alaska Clean Seas' *Alaskan Chukchi Sea Coastal Resources Manual* (1990). This report includes narrative and an atlas covering the coast from Point Barrow south to Point Hope. Information covers:

(1) Biological resources and uses
(2) Cultural and historic sites
(3) Shoreline characteristics
(4) Physical environment
--physiography
--meteorology
--oceanography
(5) Biological environment
--ecosystems
--environmentally unique and sensitive areas
--birds
--terrestrial mammals
--marine mammals
--threatened species
--fishery resources
(6) Spill response information

c. Alaska Clean Seas has also developed the *North Slope Shoreline Oil Spill Countermeasures Manual* (1994), which covers their techniques for:

(1) The description and documentation of oiled shorelines
(2) Shoreline response strategies and the decision process
(3) Guidelines by shoreline type

(4) Cleanup strategies for specific coastal environments
(5) Shoreline cleanup or treatment options
(6) Supporting information
(7) Shoreline segment summary
(8) References

d. Alaska Clean Seas has produced the *ACS Technical Manual: Map Atlas* (Revision 2010), which describes coastal currents and sensitive areas along the coast between Demarcation Point, on the USA-Canada border, and Point Hope. Tactical response methods are proposed for selected sensitive areas. Development is mapped, as are drainage patterns.

e. See the *Environmental Atlas of the Trans Alaska Pipeline System* (1993), by Alyeska Pipeline Service Company (Alyeska Atlas). The Alyeska Atlas consists of 25 maps covering the length of the Trans-Alaska Pipeline System (TAPS) and brief narratives about mammals, birds and fish found along the TAPS corridor. Each map has an overlay with the following types of information identified:

(1) Recreation Sites/Areas
(2) Scenic Areas
(3) Special Areas
(4) Subsistence Use Areas
(5) Wildlife Areas (bear, bison, caribou, sheep, fox, wolf, grouse, moose, otter, raptor, swan, waterfowl, whale)
(6) Fish Hatchery
(7) Fish Stream (anadromous, non-anadromous, overwinter)
(8) Site, Den or Nest
(9) Direction of View, Migration, Movement or Distribution
(10) Oil Spill Containment Site

f. In January 2010, Audubon Alaska, in cooperation with Oceana, published the *Arctic Marine Synthesis Atlas of the Chukchi and Beaufort Seas*. The atlas has a discussion of the synthesis of various data sources in to summary GIS maps, and discusses data gaps. Below is a list of maps in the atlas. The atlas may be found at: http://ak.audubon.org/birds-science-education/arctic-marine-synthesis-atlas-chukchi-and-beaufort-seas

PHYSICAL OCEANOGRAPHY
1. Project Area
2. Bathymetry
3. Ecoregions
4. Ocean Circulation
5. Sea Ice Dynamics
6. Sea Floor Substrate
7. Sea Surface Temperature
8. Observed Climate Change

WATER COLUMN AND BENTHIC LIFE
9. Chlorophyll-a
10. Net Primary Productivity
11. Zooplankton
12. Benthic Biomass
13. Opilio Crab

FISH
Oceanodromous
14. Capelin
15. Pacific Herring
16. Saffron Cod

Anadromous
17. Pink Salmon
18. Chum Salmon

BIRDS
Audubon Alaska WatchList
19. Yellow-billed Loon
20. Red-throated Loon
21. Spectacled Eider
22. Steller's Eider

23. King Eider
24. Common Eider
25. Long-tailed Duck
26. Ivory Gull
27. Kittlitz's Murrelet

Other Species

28. Northern Fulmar
29. Short-tailed Shearwater

Concentration Areas

30. Seabird Colonies
31. Important Bird Areas

MAMMALS

Terrestrial/Marine

32. Polar Bear
33. Arctic Fox

Pinnepeds

34. Pacific Walrus
35. Ribbon Seal
36. Spotted Seal
37. Ringed Seal
38. Bearded Seal

Cetaceans

39. Bowhead Whale
40. Beluga Whale
41. Gray Whale

PEOPLE

42. Energy Development and Protected Areas
43. Human Impact
44. Predicted Climate Change

g. In September 2011, Audubon Alaska published the *Place-based Summary of the Arctic Marine Synthesis Atlas of the Chukchi and Beaufort Seas*. This document provides two-page fact sheets summarizing synthesis information for the following places within the subarea, and may be located at: http://ak.audubon.org/files/Audubon%20Alaska/documents/Place-based_Summary_of_the_Arctic_Marine_Synthesis_FINAL.pdf

Cape Thompson & Cape Lisburne--Chukchi Sea US
Ledyard Bay--Chukchi Sea US
Kasegaluk Lagoon--Chukchi Sea US
Chukchi Lead System--Chukchi Sea US
Hanna Shoal--Chukchi Sea US
Peard Bay--Chukchi Sea US
Barrow Canyon--Beaufort Sea, Chukchi Sea US
Dease Inlet & Elson Lagoon--Beaufort Sea US
Smith & Harrison Bays--Beaufort Sea US
Western Beaufort Shelf & Lead System--Beaufort Sea US
Beaufort Lagoons & Barrier Islands--Beaufort Sea US, Canada
*Eastern Beaufort Shelf & Lead System--Beaufort Sea Canada
*MacKenzie River Delta--Beaufort Sea Canada

* pending

B. HABITAT TYPES

Shoreline habitats have been defined and ranked according to Environmental Sensitivity Index (ESI) standards produced by the National Oceanic and Atmospheric Administration (NOAA) in *Environmental Sensitivity Index Guidelines* (October 1997). Seasonal ESI maps in poster and atlas formats were produced for the subarea in 1999, with an update and expansion in 2005, as shown on the following index map. These maps are available on the internet at: http://www.asgdc.state.ak.us/maps/cplans/subareas.html.

Updated ESI information can be found on the internet at: http://response.restoration.noaa.gov/type_subtopic_entry.php?RECORD_KEY%28entry_subtopic_type%29=entry_id,subtopic_id,type_id&entry_id(entry_subtopic_type)=74&subtopic_id(entry_subtopic_type)=8&type_id(entry_subtopic_type)=3

1. Benthic Habitats

Oil vulnerability is lower in benthic (near bottom) areas than in the intertidal zone since contamination by floating slicks is unlikely. Sensitivity is derived from the species which use the habitat. Benthic habitats have not been traditionally classed by ESI rankings, but are treated more like living resources which vary with season and location. Benthic habitats include: submerged aquatic vegetation beds, large beds of kelp, worm reefs, coral reefs, and the boulder patch.

2. Shoreline Habitats

Habitats (estuarine, large lacustrine and riverine) ranked from least (#1) to most (#10) sensitive (see the following table) are described below:

ESI #1--Exposed impermeable vertical substrates: exposure to high wave energy or tidal currents on a regular basis, strong wave-reflection patterns common, substrate is impermeable with no potential for subsurface penetration, slope of intertidal zone is 30 degrees or greater, attached organisms are hardy and accustomed to high hydraulic impacts.

ESI #2--Exposed impermeable substrates, non-vertical: exposure to high wave energy or tidal currents on a regular basis, strong wave-reflection patterns regular, substrate is impermeable with no potential for subsurface penetration over most of intertidal zone, slope of intertidal zone is less than 30 degrees, there can be accumulated but mobile sediments at the base of cliff, attached organisms are hardy and accustomed to high hydraulic impacts.

ESI #3--Semi-permeable substrate: substrate is semi-permeable with oil penetration less than 10 cm, sediments are sorted and compacted, slope is less than 5 degrees, sediment and potential for rapid burial mobility is low, surface sediments are subject to regular reworking by waves, there are relatively low densities of infauna.

ESI #4--Medium permeability substrate: substrate is permeable with oil penetration up to 25 cm, slope is 5 - 15 degrees, rate of sediment mobility is high with accumulation of up to 20 cm of sediments in a single tidal cycle, sediments are soft with low trafficability, low densities of infauna.

ESI #5--Medium to high permeability substrate: substrate of medium to high permeability which allows oil penetration up to 50 cm, spatial variations in distribution of grain sizes with finer ones at high tide line and coarser ones in the storm berm and at toe of beach, 20 percent is gravel, slope between 8 and 15 degrees,

sediment mobility is high during storms, sediments are soft with low trafficability, low populations infauna and epifauna except at lowest intertidal levels.

ESI #6--High permeability substrates: substrate is highly permeable with oil penetration up to 100 cm, slope is 10 to 20 degrees, rapid burial and erosion of shallow oil can occur during storms, high annual variability in degree of exposure and frequency of wave mobilization, sediments have lowest trafficability of all beaches, natural replenishment rate is the lowest of all beaches, low populations of infauna and epifauna except at lowest intertidal levels.

ESI #7--Exposed flat permeable substrate: flat (less than 3 degrees) accumulations of sediment, highly permeable substrate dominated by sand, sediments are well saturated so oil penetration is limited, exposure to wave or tidal-current energy is evidenced in ripples or scour marks or sand ridges, width can vary from a few meters to one kilometer, sediments are soft with low trafficability, high infaunal densities.

ESI #8--Sheltered impermeable substrate: sheltered from wave energy and strong tidal currents, substrate of bedrock or rocky rubble, variable in oil permeability, slope greater than 15 degrees with a narrow intertidal zone, high coverage of attached algae and organisms.

ESI #9--Sheltered flat semi-permeable substrate: sheltered from wave energy and strong tidal currents, substrate is flat (less than 3 degrees) and dominated by mud, sediments are water-saturated so permeability is low, width varies from a few meters to one kilometer, sediments are soft with low trafficability, infaunal densities are high.

ESI #10--Vegetated wetlands: marshes and swamps with various types of emergent herbaceous grasses and woody vegetation over flat mud to sand substrate—highly organic mud is common.

3. Upland Habitats

At this time, no uplands or wetlands classifications directly related to sensitivity to oil spills have been identified. A general wetlands classification has been developed by the U.S. Fish and Wildlife Service, National Wetlands Inventory, in Anchorage. Considerable mapping of wetlands has been completed, some of which are available in a Geographic Information System database (see the following figure). Updated map data is being placed on the National Wetlands Inventory Internet web site at: http://wetlands.fws.gov/

ESI HABITAT RANKING			
ESI NO.	**ESTUARINE**	**LACUSTRINE**	**RIVERINE (large rivers)**
1 A	Exposed rocky cliffs	Exposed rocky cliffs	Exposed rocky banks
1 B	Exposed sea walls	Exposed sea walls	Exposed sea walls
2	Exposed wave-cut platforms	Shelving bedrock shores	Rocky shoals; bedrock ledges
3	Fine- to medium-grained sand beaches	Eroding scarps in unconsolidated sediments	Exposed, eroding banks in unconsolidated sediments
4	Coarse-grained sand beaches	Sand beaches	Sandy bars and gently sloping banks
5	Mixed sand and gravel beaches	Mixed sand and gravel beaches	Mixed sand and gravel bars and gently sloping banks
6 A	Gravel beaches	Gravel beaches	Gravel bars and gently sloping banks
6 B	Riprap	Riprap	Riprap
7	Exposed tidal flats	Exposed flats	Not present
8 A	Sheltered rocky shores	Sheltered scarps in bedrock	Vegetated, steeply sloping bluffs
8 B	Sheltered sea walls	Sheltered sea walls	Sheltered sea walls
9	Sheltered tidal flats	Sheltered vegetated low banks	Vegetated low banks
10 A	Saltwater marshes		
10 B	Freshwater marshes	Freshwater marshes	Freshwater marshes
10 C	Freshwater swamps	Freshwater swamps	Freshwater swamps
10 D	Mangroves		

"Environmental Sensitivity Index Guidelines" (October 1995) NOAA Technical Memorandum NOS ORCA 92

Insert ESI index map here

http://www.asgdc.state.ak.us/maps/cplans/ns/PDFs/ESI_DATA/INDEX.PDF

Wetland status map figure here

http://www.r7.fws.gov/fisheries/nwi/index.htm

C. BIOLOGICAL RESOURCES

1. Threatened and Endangered Species

Federally listed threatened and endangered species are protected under the Endangered Species Act. Spill response activities which could impact a listed species should be coordinated with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. With the exception of the bowhead whale, all the species listed below are also on the State of Alaska's endangered species list. Threatened and endangered species potentially present in the North Slope subarea include:

The following species[1] and critical habitat occur in Alaska and have been provided protection under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.):

Table 1: Endangered Species Act of 1973 Protected species and critical habitat

Listed species	Stock	Latin Name	Status
Bowhead whale		*Balaena mysticetus*	Endangered
Spectacled eider		*Somateria fischeri*	Threatened
Steller's eider		*Polysticta stelleri*	Threatened
Eskimo curlew		*Numenius borealis*	Endangered
Polar bear		*Ursus maritimus*	Threatened

Designated Critical Habitat	
Species Group	**General Reference Area**
Whales	No critical habitat has been designated for the above referenced whales in Alaska waters.
Polar bear	Selected coastal areas are designated as critical habitat (see maps below)
Steller's eider	No critical habitat has been designated in the North Slope subarea
Spectacled eider	Ledyard Bay is designated as critical habitat for molting (see map below)

Spectacled eiders, Steller's eiders, and Eskimo curlews are under the jurisdiction of the U.S. Fish and Wildlife Service.

The Alaskan bald and golden eagles, though not on the endangered species list, are fully protected (including their nests and nest trees) under the Bald Eagle Protection Act of 1940 and the Migratory Bird Treaty Act. Spill response activities that could affect these species should be coordinated with the U.S. Fish and Wildlife Service.

While the National Marine Fisheries Service has determined the gray whale is no longer a threatened or endangered species, monitoring of the species has continued since the 1994 delisting. All marine mammals, whether or not they are on the endangered species list, are protected by the Marine Mammal Protection Act of 1972. Any spill response activities, which could affect marine mammals, should be coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. A study of the status of the polar bear is underway by the U.S. Fish and Wildlife Service.

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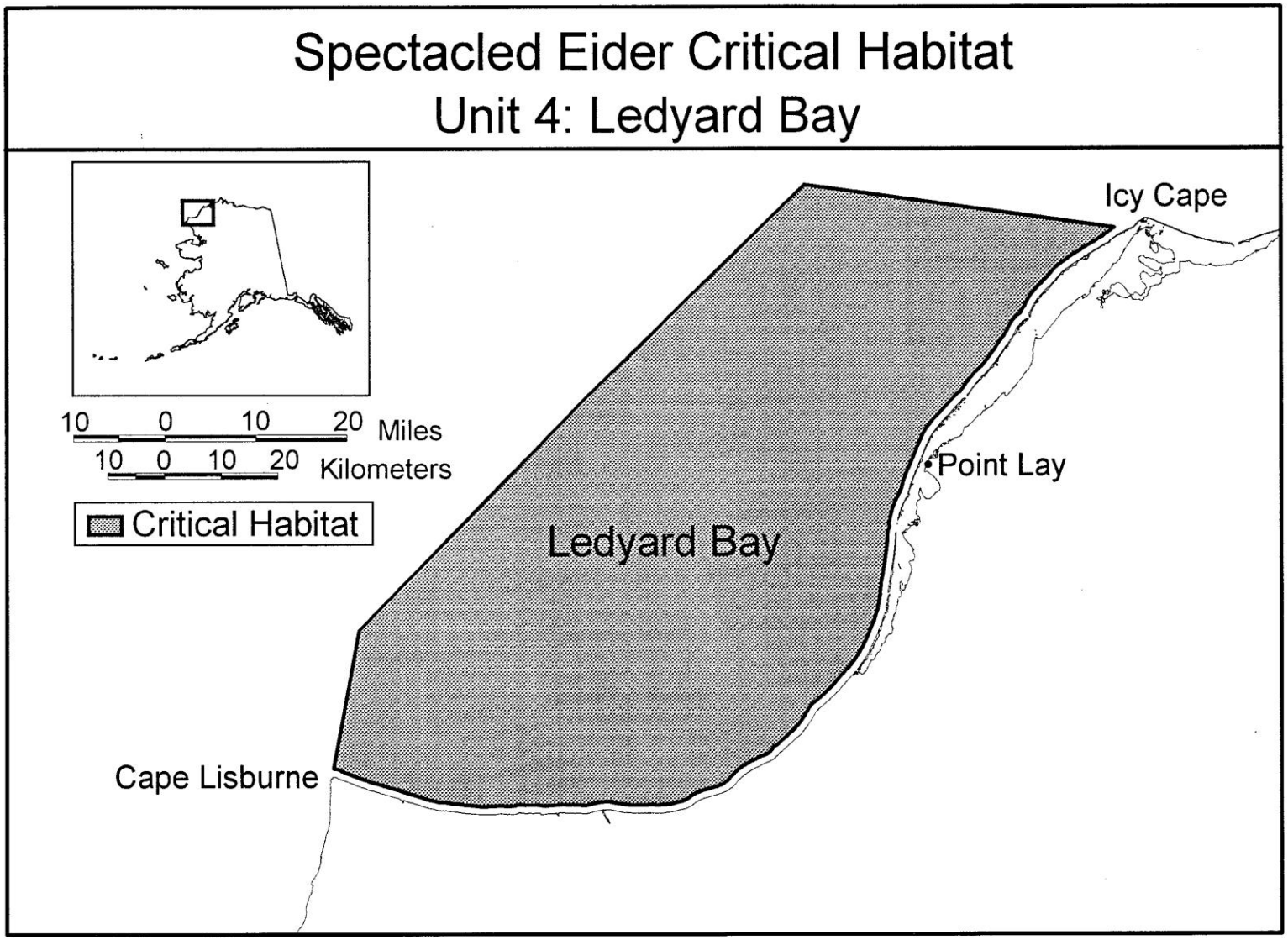
[1] In its definition of species, the Endangered Species Act of 1973, as amended, includes the traditional biological species concept of the biological sciences and "any subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature" (16 USC 1532). NMFS uses the term *evolutionarily significant unit* as synonymous with *distinct population segment* and lists Pacific salmon accordingly. For the purposes of section 7 consultations, these are all "species."

For updated information on the internet:

U.S. Fish and Wildlife Service National Threatened and Endangered Species web site:
http://endangered.fws.gov/

U.S. Fish and Wildlife Service Regional Threatened and Endangered Species web site:
http://www.r7.fws.gov/fisheries/endangered/listing.htm

Alaska Department of Fish and Game Threatened and Endangered Species web site:
http://www.wildlife.alaska.gov/index.cfm?adfg=endangered.main


Spectacled Eider Critical Habitat
Unit 4: Ledyard Bay
10 0 10 20 Miles
10 0 10 20 Kilometers
Critical Habitat
Icy Cape
Point Lay
Ledyard Bay
Cape Lisburne

Insert polar bear critical habitat map #1 of 2:

http://alaska.fws.gov/fisheries/mmm/polarbear/maps_final/index_2of3.pdf

Insert polar bear critical habitat map #1 of 2:

http://alaska.fws.gov/fisheries/mmm/polarbear/maps_final/index_1of3.pdf

2. Fish and Wildlife

(a) Fish

ESSENTIAL FISH HABITAT (EFH)

In 1996 Congress added new habitat provisions to the Magnuson-Stevens Fishery Conservation and Management Act, the federal law that governs U.S. marine fisheries management. Under the Magnuson-Stevens Act, each fishery management plan must describe and identify EFH for the fishery, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage the conservation and enhancement of EFH. Federal agencies must consult with the National Marine Fisheries Service on any action they authorize, fund, or undertake that may adversely affect EFH, and the National Marine Fisheries Service must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH. Reference information for EFH in the subarea as identified by the National Marine Fisheries Service, can be found on their internet site at:

http://alaskafisheries.noaa.gov/habitat/efh.htm .

An additional EFH resource is their interactive mapping internet site:

http://mapping.fakr.noaa.gov/Website/EFH/viewer.htm?simple

ANADROMOUS AND MARINE FISH

The Alaska Department of Fish and Game Anadromous Waters Catalog Maps may be found at the following web site:
http://www.adfg.alaska.gov/sf/SARR/AWC/index.cfm?ADFG=maps.selectMap&Region=ARC

Fish are found in marine waters, most streams and some lakes of the North Slope Subarea. If the depth of the water exceeds three or four meters (as ice depth may exceed two meters by late winter), fish may be found in a particular waterbody year-round. Fish may use shallow lakes (< 2-3 m deep) in summer if the lakes are connected to a stream system and sufficient water exists in late summer for fish to leave the lake and move to overwintering areas. Shallow tundra beaded streams (< 2-3 m deep) freeze solid in winter and thus can be used by fish only for summer rearing. River deltas are particularly important areas for fish throughout the year. Anadromous fish commonly use brackish nearshore waters near river deltas and landward of the barrier islands during summer. Small, shallow streams or lagoons connecting directly to the sea may be used by anadromous fish during the summer months. These same areas may be used by freshwater resident fish if these areas are near major rivers and within the influence of the freshwater plume.

Overwintering areas are confined to deep lakes; major rivers that have deep, discontinuous pools; and rivers that have perennial groundwater springs (usually indicated by the formation of aufeis fields in winter). Virtually all major rivers have areas with conditions suitable for overwintering fish. Although many rivers have not been examined for overwintering fish, those portions of rivers with depths greater than 2-3 meters should be considered potential fish overwintering habitat and protected accordingly.

Freshwater Fish Freshwater fish found in North Slope lakes and streams include arctic grayling, round, humpback, and broad whitefish, least cisco, arctic char, stream-resident Dolly Varden, slimy sculpin, burbot, lake trout, ninespine stickleback, and northern pike. Freshwater species may be found in the

deeper lakes and in rivers and streams containing perennial springs and/or deep waters suitable for overwintering.

Most lakes deep enough to contain freshwater fish year-round in the eastern and central portions of the North Slope are within the mountain and the foothills provinces. A few lakes within the Colville River delta are deep enough to overwinter fish. West of the Colville River, most of the lakes deep enough to contain fish are found within the coastal plain province between Barrow and the Colville River. A few deep lakes containing fish also are found in the western foothills and mountains.

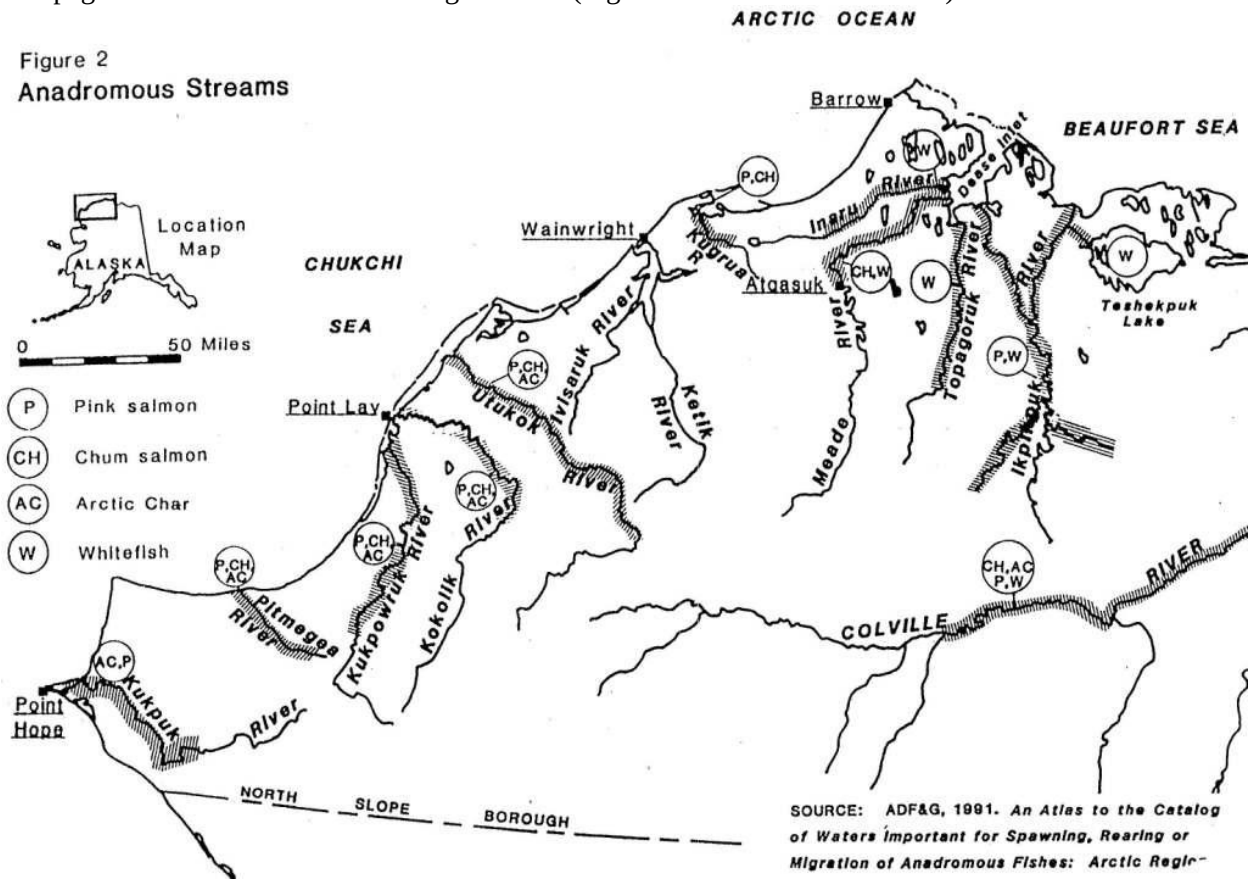
Anadromous Whitefish Anadromous populations of whitefish (broad and humpback whitefish, least and arctic cisco) migrate from overwintering areas to estuarine and nearshore brackish marine waters at breakup during mid-May to early July. Whitefish remain in the nearshore marine and estuarine environment for several weeks to several months. They return to overwinter and spawn in major rivers in September and October (except mature arctic cisco which return to the Mackenzie River drainage in Canada to spawn). **Figures 2-4** illustrate drainages known to be used by anadromous whitefish.

Anadromous Dolly Varden Anadromous populations of Dolly Varden spend up to their first five years in freshwater streams before migrating to marine summer feeding areas. **Figures 2-4** illustrates drainages known to be important to anadromous Dolly Varden. Immature and mature Dolly Varden migrate from overwintering areas to marine feeding areas following breakup in mid-May to early July. **Figure 5** illustrates their known overwintering areas. Fish feed in the nearshore marine environment from several weeks to several months and begin returning to freshwater spawning and overwintering areas from July through October. Spawning occurs from September through December. Fry emerge from the streambed gravels between April and early June. Spawning and overwintering areas are restricted to streams with perennial springs and groundwater sources. These highly restricted areas occur in drainages from the Colville River eastward to the Alaska-Canada border. Few anadromous Dolly Varden are found in streams along the northern Chukchi Sea coast. Significant numbers of Dolly Varden are found in the Noatak, Kivalina and Wulik River drainages, portions of which are included in this contingency planning region.

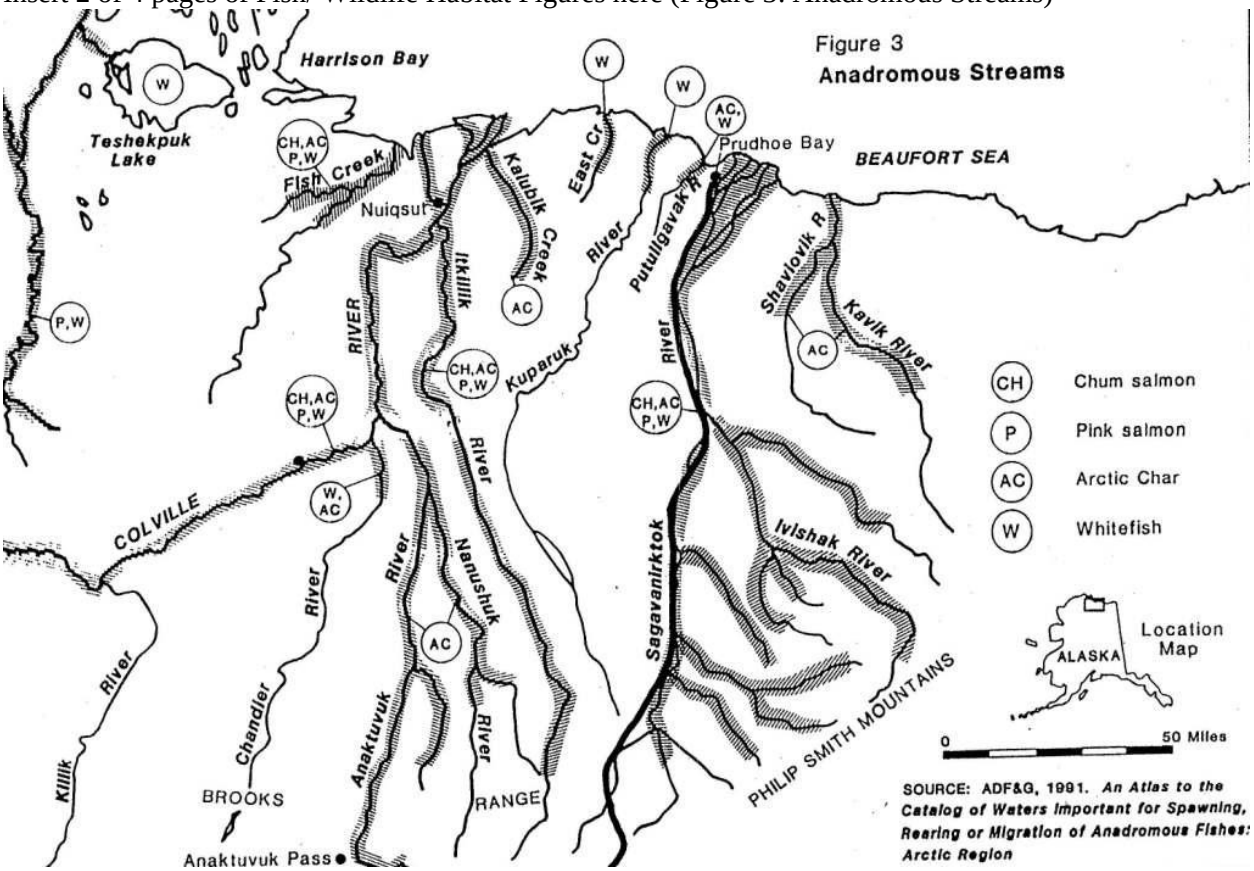
Salmon Pink and chum salmon are found in limited numbers in the Beaufort and northern Chukchi Sea drainages of the North Slope Subarea (see **Figures 2-4**). They occur in major rivers in the North Slope Subarea from the Kukpuk River in the southwestern portion of the region to the Canning River in the eastern portion of the region. Salmon are more abundant in the Chukchi Sea drainages than in the Beaufort Sea drainages. Salmon spawning occurs in August or September. Eggs incubate in the stream gravels over the winter and fry, hatched in late winter, migrate to sea following breakup in late May to late June. Chinook (kings) are reported to occur as far east as the Sagavanirktok River, and sockeye (reds) are reported southeast of Barrow, but no established spawning runs are recorded.

Marine Fish Arctic cod and fourhorn sculpin are the most common marine fish species in nearshore waters. Pacific herring, capelin, arctic flounder and saffron cod are also found nearshore, particularly during the open water period in the Chukchi Sea.

Insert 1 of 4 pages of Fish/ Wildlife Habitat Figures here (Figure 2: Anadromous Streams)

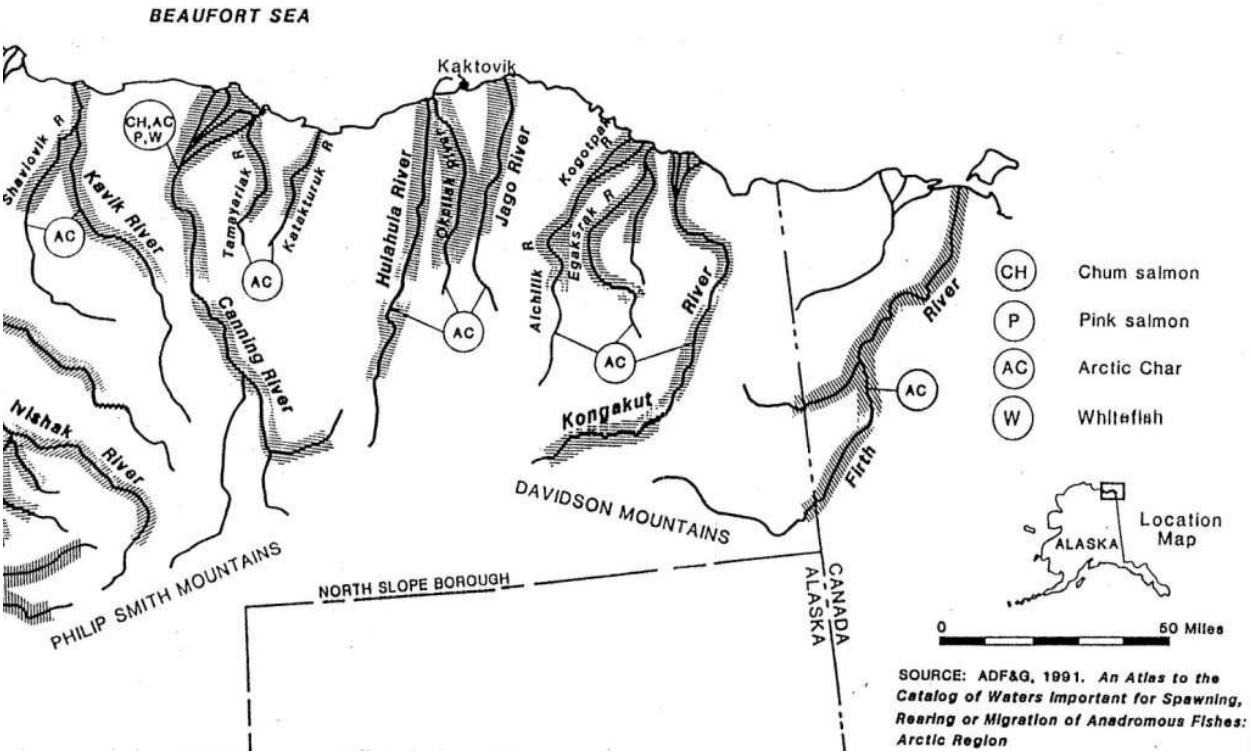


Insert 2 of 4 pages of Fish/ Wildlife Habitat Figures here (Figure 3: Anadromous Streams)

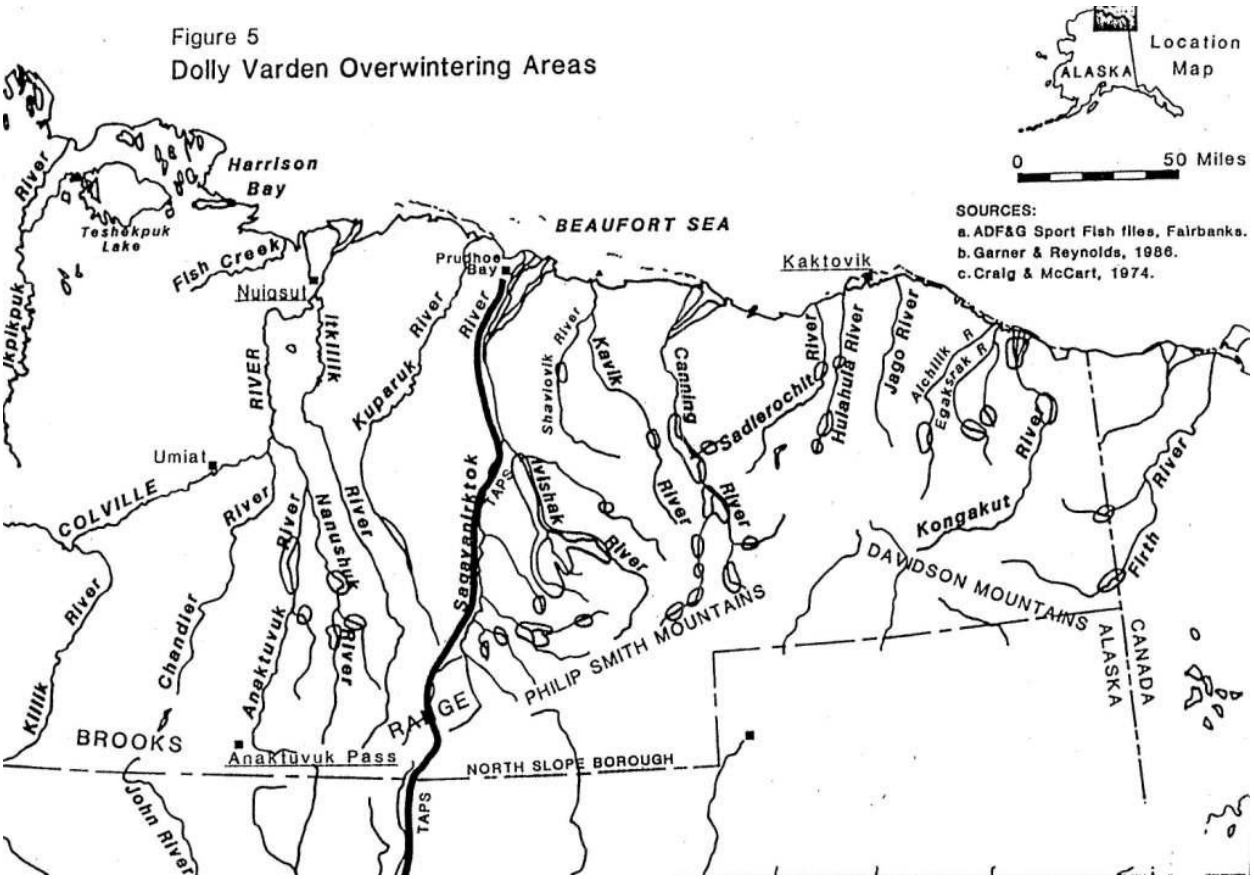


Insert 3 of 4 pages of Fish/ Wildlife Habitat Figures here (Figure 4: Anadromous Streams)

Figure 4
Anadromous Streams



Insert 4 of 4 pages of fish/ wildlife habitat figures here (Figure 5; Dolly Varden Overwintering Areas)



(b) Birds

Geese, Loons, and Tundra Swans (see **Figures 6 & 7** for distribution) Canada, snow, and greater white-fronted geese, brant, tundra swans, and loons (Pacific, red-throated, and yellow-billed) nest along lakes, wetlands, and rivers within the North Slope Subarea, primarily within the coastal plain province. Important brood-rearing and fall staging areas include salt marshes, mudflats, river deltas, lagoons, and coastal tundra areas along the Beaufort and Chukchi Sea coasts. Birds arrive from early May through June, nest during June and July, molt and rear young during July and August, and undertake fall migration during late August through September. Twenty to sixty thousand non-breeding and sub-adult geese migrate to the large lake area north and east of Teshekpuk Lake (from the Kogru River to Smith Bay) to molt in July and early August. Other smaller molting areas for geese include the Colville, Canning, Okpilak, Putuligayuk, Kuparuk, and Sagavanirktok River deltas; and the Icy Cape area within Kasegaluk Lagoon. The Icy Cape area within Kasegaluk Lagoon and Peard Bay are important fall staging areas along the Chukchi Sea coast. Yellow-billed loons are a species of concern within a Federal-State Conservation Plan currently being drafted. Most breeding concentrations are found between the Mead and Colville rivers, primarily around large, deep lakes that support resident fish.

Most brant nest in colonies adjacent to the coast, but some are as far as 30 kilometers inland. The largest colonies of breeding brant are on the Colville River delta. Colonies also occur on the Sagavanirktok and Kuparuk River deltas. The Colville River delta is also an important nesting area for yellow-billed loons and white-fronted geese, and an important molting area for non-breeding tundra swans. The Canning, Colville, and Kongakut River deltas are high-density tundra swan nesting areas.

Two nesting colonies of snow geese occur in Alaska: one on an island in the Kukpowruk River delta and one on Howe Island, off the Sagavanirktok River delta. Snow geese are concentrated on Howe Island and the Sagavanirktok River delta for nesting, brood-rearing, and molting from late May through mid-to-late September. Snow geese are abundant fall migrants on the coastal plain and foothills of the Arctic National Wildlife Refuge in mid August through late September. Up to 325,000 snow geese use the coastal plain and the foothills between the Hulahula and Aichilik Rivers as a fall feeding area before migrating south.

Ducks **Figures 6-7** illustrate concentration areas of ducks and other waterfowl. Ducks nest throughout the North Slope Subarea. Important feeding and fall staging areas for ducks include river deltas, lagoons, waters shoreward of barrier islands, salt marshes, mudflats, and coastal tundra areas. Nesting, brood-rearing, and migration periods are similar to those described for geese. Many waterfowl follow the offshore Chukchi lead system during their spring migration.

Tens to hundreds of thousands of oldsquaw congregate in protected waters to molt and feed intensively from late June to late September before beginning their fall migration (late August to late September). These molting and feeding areas include Demarcation and Peard bays; waters shoreward of barrier islands and spits; and the lagoon systems of the Chukchi and Beaufort Sea coasts. Most molting surf scoters are found in Harrison Bay, offshore of the Colville River delta. Barrier islands serve as important nesting habitat for common eiders. Several thousand common eiders nest in colonies along the barrier islands and islets of the Chukchi and Beaufort Sea coasts. Peard and Kugrua Bays also serve as molting and brood-rearing areas for king and common eiders, and long-tailed ducks. Hundreds of thousands of king eiders molt and feed in offshore waters along the Chukchi Sea coast from late June through August. Some eiders use nearshore areas of Peard Bay and areas within Kasegaluk Lagoon for molting. Fall migration for king eiders occurs from late July to as late as November in the Chukchi Sea.

Seabirds The **2000 Seabird Population** figure illustrates the location of known seabird colonies. Seabirds (murres, puffins, kittiwakes, gulls) are most abundant in the Cape Thompson and Cape Lisburne

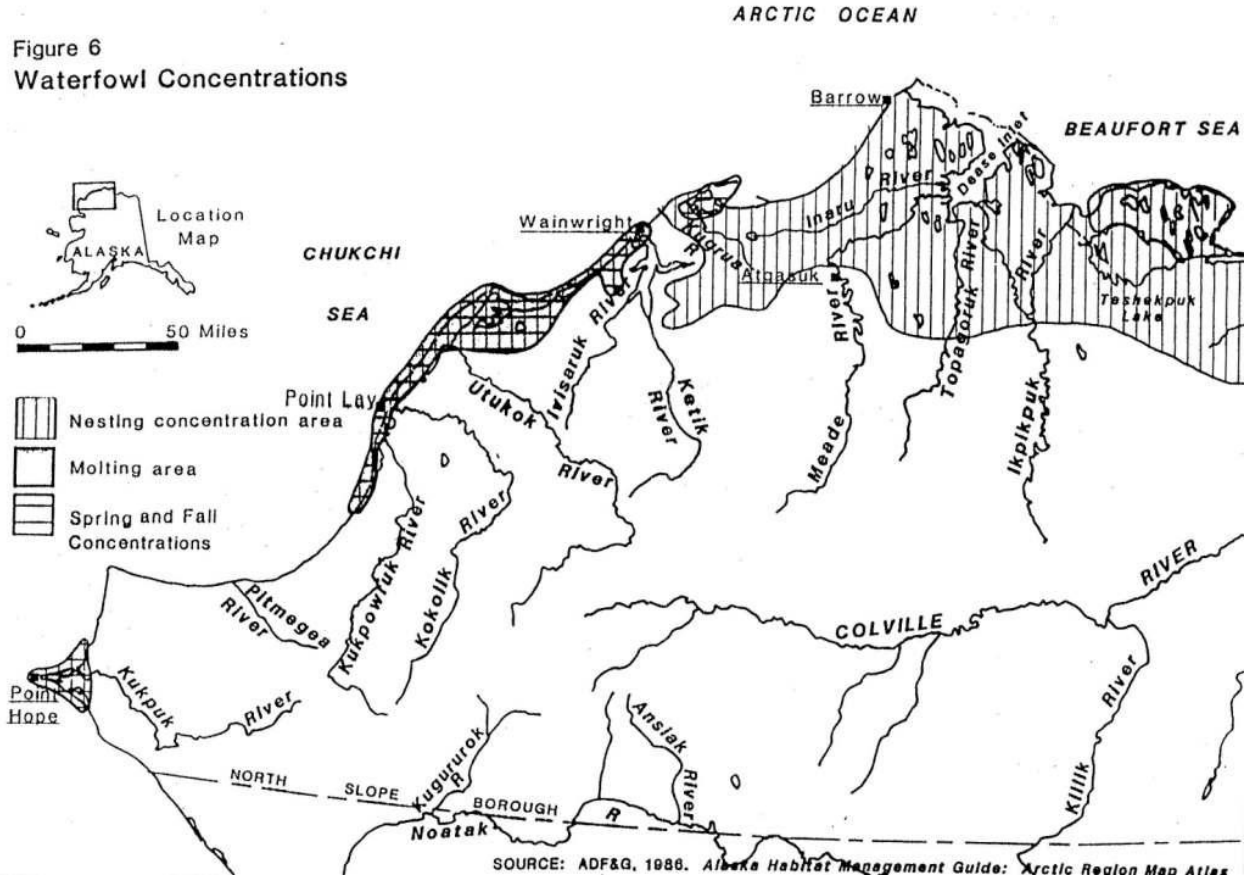
areas. Capes Thompson, Lewis, and Lisburne have colonies of cliff-nesting seabirds numbering between 100,000 and 1,000,000 birds. These seabirds arrive in mid-May and occupy the colonies through September. Gulls and terns nest on lakeshores, barrier islands, and spits throughout the North Slope Subarea. Twenty to forty thousand Ross' gulls from Siberian nesting areas (most of the world's population) occur in the nearshore areas of the Barrow area in mid-September to mid-October. Black guillemots nest primarily on barrier islands of the Plover Islands group, although small groups may be found east to Jago Spit. A major colony of black guillemots also occurs at the Seahorse Islands in Peard Bay.

The Alaskan Seabird Colony Catalog is an automated database that contains the distributions of breeding seabirds and the relative size of all the colonies in Alaska. The data reports indicating estimated species composition and numbers for seabird colonies of the subarea are summarized from the catalog. The maps display colony locations. The Alaska Seabird Colony Catalog is maintained by the U.S. Fish and Wildlife Service--see the seabird colony map on the following page.

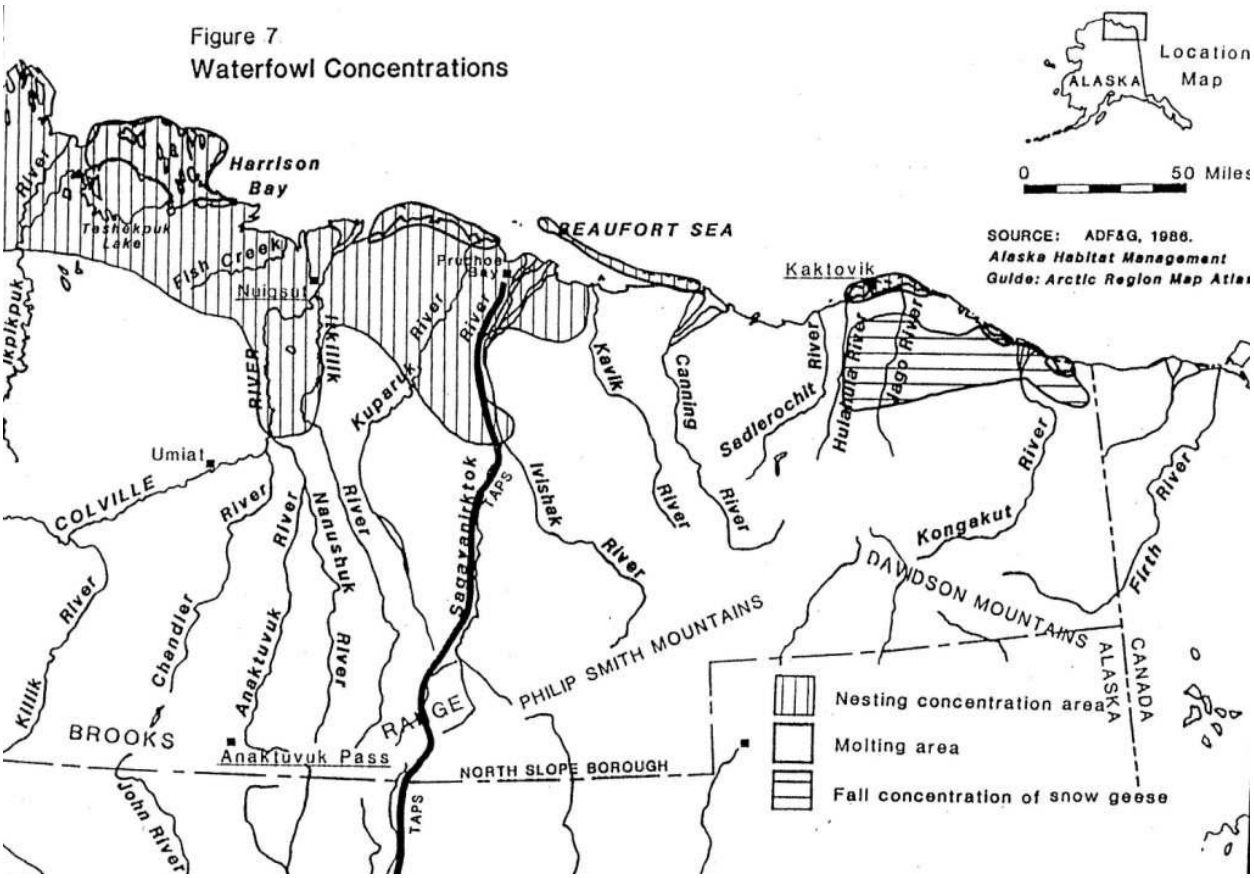
Shorebirds Shorebirds (sandpipers, plovers, phalaropes) arrive in the North Slope Subarea beginning in late May and begin nesting on tundra wetland habitat by mid-June. Most eggs hatch from late June to mid-July. Shorebirds congregate along the barrier islands, coastal lagoons, salt marshes, river deltas, and mudflats in mid-July and August to feed before their fall migration in August or September (some may begin their fall migration in July). Concentration areas include Beaufort, Simpson, Elson, and Kasegaluk Lagoons; the Hulahula, Canning, Sagavanirktok, Fish Creek, and Colville River deltas; the mouth of the Kuk River, and Peard Bay.

Raptors Commonly occurring raptors in the North Slope Subarea include golden eagles, peregrine falcons, gyrfalcons, rough-legged hawks, snowy owls, and short-eared owls. Except for snowy owls and gyrfalcons, which are year-round residents, all other raptors winter in areas south of the North Slope. The migratory species arrive on the North Slope in early May and depart in late August or September. With the exception of the tundra-nesting snowy and short-eared owls, raptors nest on the cliffs, bluffs and steep terrain common in the foothills and mountains.

Insert 1 of 2 pages of waterfowl concentration figures here (figure 6, wildlife habitat figures)



Insert 2 of 2 pages of waterfowl concentration figures here (figure 7, wildlife habitat figures)



Insert 1 page seabird colony map here

http://www.asgdc.state.ak.us/maps/cplans/ns/ns5seabird.pdf

(c) Marine Mammals

Polar Bears Polar bears are associated with sea ice along the Beaufort and Chukchi Sea coasts. During summer, polar bears are concentrated along the southern edge of the pack ice, although they may be found on land when the pack ice edge is near shore. Coastal aggregations of polar bears are particularly vulnerable to the effects of an oil spill during the open water/broken-ice period. Specific coastal aggregation areas include Cross Island, Barter Island, and Point Barrow. When on shore, bears commonly feed on beached marine mammal carrion. In winter, polar bears are found along the pack ice/shorefast ice flaw zone, although they may be seen along the coastline at any time. Polar bears may also be found inland along bluffs and river and creek drainages, particularly in the fall when females are searching for suitable denning habitat. In late October or November, pregnant females seek out denning areas in snowdrifts on land (mostly within 50 km of the coast), offshore islands (particularly the Flaxman and Cottle Island groups), on shorefast ice, or drifting sea ice. Females and cubs emerge from the maternity dens in late March/early April.

Seals Three species of seal commonly occur in the nearshore waters of the North Slope Subarea: ringed seal, bearded seal, and spotted seal.

The ringed seal is the most common species of seal found in the Chukchi and Bering Seas. Most ringed seal pups are born in March or April in birthing lairs constructed on shorefast ice with adequate snow cover. The seal pups remain in the lairs for four to six weeks until they are weaned. Ringed seals molt from late March until July, with peak molting occurring in June. Molting occurs on shorefast ice as well as on large flat ice flows in the pack ice. During summer, most ringed seals are found along the edge of the permanent ice pack. They return to nearshore areas in late fall and early winter as the shorefast ice reforms. The shorefast ice between Cape Lisburne and Point Lay has one of the highest densities of ringed seals within the North Slope Subarea.

The largest known concentration (several thousand) of spotted seals in Alaska haul out on sandy spits and shoals at Kasegaluk Lagoon from mid-July until freeze-up in late October or early November. Additional haulout and concentration areas along the Chukchi Sea coastline include the mouth of the Kugrua River in southern Peard Bay, and the mouth of the Kuk River. Haulout and concentration areas in the Beaufort Sea include the Colville River delta, Oarlock Island in Dease Inlet, and the mouth of the Piasuk River in Smith Bay. Seals move out of the Beaufort Sea from September to mid-October as the shorefast ice reforms.

Bearded Seals are primarily along the pack ice-edge and consequently are not found frequently in nearshore waters. Bearded seals are more common in the Chukchi Sea than in the Beaufort Sea.

Beluga Whales Beluga whales appear along the Chukchi Sea coast in late March as ice begins to break up. **Figures 10-11** illustrate spring and fall migration routes. Whales head to Canadian waters for summer feeding pass by Point Barrow from April through May, and continue their eastward migration in offshore waters. A second group of two to three thousand beluga whales (the largest known concentration in Alaska) uses the Kasegaluk Lagoon area and the coastline south to Ledyard Bay for feeding, molting, and calving from mid-June through mid-August. Belugas may be found inside or outside of the lagoon's barrier islands and usually are found at the major passes of the lagoon. Belugas using Kasegaluk Lagoon continue moving northward in late July and August. Southward movements to wintering areas begin in August and continue through October for those whales summering in Canadian waters, and in late September or October for those whales summering in the Chukchi Sea.

Bowhead Whales Bowhead whales move northward along the Chukchi Sea coast as recurrent lead systems (polynyas) expand in the sea ice in spring. **Figures 10-11** illustrate bowhead migration routes. Bowhead

whales appear in the Point Hope/Cape Lisburne area in late March through early May. Most of the whales move past Barrow from late April through May. Bowhead whales migrate offshore from Point Barrow to their summer feeding grounds in Canadian waters. During their fall migration in the Beaufort Sea (August to October), bowhead whales travel west closer to shore than during the spring migration. Fall migration in the Chukchi Sea, however, occurs further offshore than in the spring. Known feeding concentration areas (August to October) are found between the Alaska/Canada border and Pokok Lagoon, and from Pitt Point to Point Barrow.

Other Whales Gray whales enter the Chukchi Sea and occasionally the Beaufort Sea during the ice free season (June to October). They concentrate in the nearshore waters (mainly in August and September) between Icy Cape and Barrow (including Peard Bay), and most of the waters around the Lisburne Peninsula. Killer and fin whales are seen occasionally along the Chukchi Sea coast.

Walruses Walruses begin appearing in the Point Hope/Cape Lisburne area in June. During July through September, walruses (mostly females, young, and sub-adults) are concentrated in the ice off the coast from Icy Cape to Barrow. They return to the Bering Sea to winter. Males generally remain in the Bering Sea year-round. During the summer months, walruses may occur in the Beaufort Sea as far east as Kaktovik. Walruses irregularly haulout on the shoreline along the Cape Lisburne and Point Hope areas.

(d) Terrestrial Mammals

Caribou Caribou are found throughout the subarea during the entire year, but are more abundant during the spring and summer, particularly in the eastern and western sections of the region. Calving occurs in early June for the four herds that use the region. **Figures 12-13** illustrate caribou calving areas. During the peak insect harassment season (July to mid August), caribou seek insect relief along coastlines and river deltas, barrier islands, mudflats, lake margins, gravel bars, snow and aufeis fields, and on windy mountain slopes and ridges.

The Porcupine Caribou Herd (PCH) currently numbers about 123,000 animals (in 2001), and is found in northeastern Alaska and northwestern Canada. The PCH calves on the northern foothills of the Brooks Range and on the coastal plain from the Yukon Territory to the Canning River. Calving occurs most frequently in the uplands of the Jago River, extending as far west as the Sadlerochit River and east to the Aichilik River. Calving occurs in relatively snow-free areas from late May to mid-June, with peak calving occurring in the first week of June. The herd generally forms large aggregations following calving and may move to the coast during mid-summer when insect harassment is at its peak. By early August, most of the herd is scattered widely throughout the Brooks Range and into Canada. The PCH uses two major winter ranges: the central Yukon Territory in Canada and northeastern Alaska in the vicinity of Arctic Village. Some caribou may winter on the north side of the northeastern Brooks Range.

The Central Arctic Herd (CAH) numbers about 32,000 (in 2002) caribou and generally uses the area between the Colville and Canning rivers. The CAH calves in the low hills southwest of Bullen Point east to the Canning River delta; in the low hills of the Kuparuk and Ugnuravik river drainages; and in the Kuparuk development area. Some calving also occurs in the thaw-lake coastal plain portion of these areas. Caribou seek insect relief along the coast from the Colville River delta to the area of the Kuparuk River delta, and from the Sagavanirktok River delta to Camden Bay. A gradual southward movement to wintering areas in the foothills and mountains of the northcentral Brooks Range begins in late August or early September. The distribution of the CAH may overlap with that of the WAH on winter range in some years, and may overlap with the distribution of the PCH on summer range.

The Teshekpuk Lake Herd (TLH) numbers about 26,000 (in 1995) caribou and occupies an area between the Colville River delta and Wainwright. Calving generally occurs to the northeast of Teshekpuk Lake, although the area southwest of Teshekpuk Lake also was used. Insect relief areas for this herd during late June through late July include the Beaufort Sea coast from the Ikpikpuk River east to the Kogru River and Atigaru Point, the Ikpikpuk River delta, the Kealok Creek delta, and the edges and islands of Teshekpuk Lake. During winter, the herd disperses to the east and west of Teshekpuk Lake, with major concentrations occurring in the Dease Inlet area. Overlap of the TLH with the WAH may occur on fall and winter ranges.

The Western Arctic Herd (WAH) numbers about 490,000 (in 2003) caribou. The range of this herd includes most of the North Slope and Brooks Range west of the Dalton Highway, the Kobuk and Noatak river valleys, and portions of the Seward Peninsula. The primary calving area for the WAH (referred to as the Utukok calving grounds) occurs in the area of the middle and upper Utukok River, the middle Kokolik River, and the headwaters of the Ketik and Colville Rivers. Following calving, the herd generally moves west toward the Lisburne Hills before dispersing to summer range. Summer range includes the northern slopes and foothills of the Brooks Range, the arctic coastal plain of the North Slope, and portions of the western and central Brooks Range south of the continental divide. Wintering areas include the coastal plain of the North Slope, the northern foothills of the Brooks Range, the Seward Peninsula, and some of the major river valleys on the south side of the western and central Brooks Range.

Muskoxen Most of the muskoxen in the North Slope Subarea are found within the boundaries of the Arctic National Wildlife Refuge, where the population numbers less than 400 animals. They are particularly declining in the east. About 130 muskoxen range west of the Arctic National Wildlife Refuge to the Colville River. About 125 muskoxen are in the Cape Thompson area along the Chukchi Sea coast south of Cape Lisburne. Muskoxen are found primarily along major river drainages throughout the year. Riparian vegetation associated with river floodplains and terraces in these drainages, particularly willow thickets during summer, serves as major feeding habitat for muskoxen. Windblown ridges, bluffs, and slopes that remain partially or completely snow-free are preferred habitats in winter and during the calving period in late April to mid-June.

Brown Bear Brown bear are distributed widely across the North Slope Subarea. Concentrations of bears may be found along the Pitmegea River when spawning salmon are present; at beached marine mammal carcasses along the Chukchi Sea coastline between Cape Seppings and Cape Thompson, and between Cape Lisburne and Kasegaluk Lagoon; and in caribou calving grounds and migration corridors. Bears are commonly found in major North Slope river valleys in spring after emerging from their dens. Denning occurs from mid-October through November. Bears emerge from their dens from early April through late May. Riparian areas are prime habitat for brown bear all season (April through November).

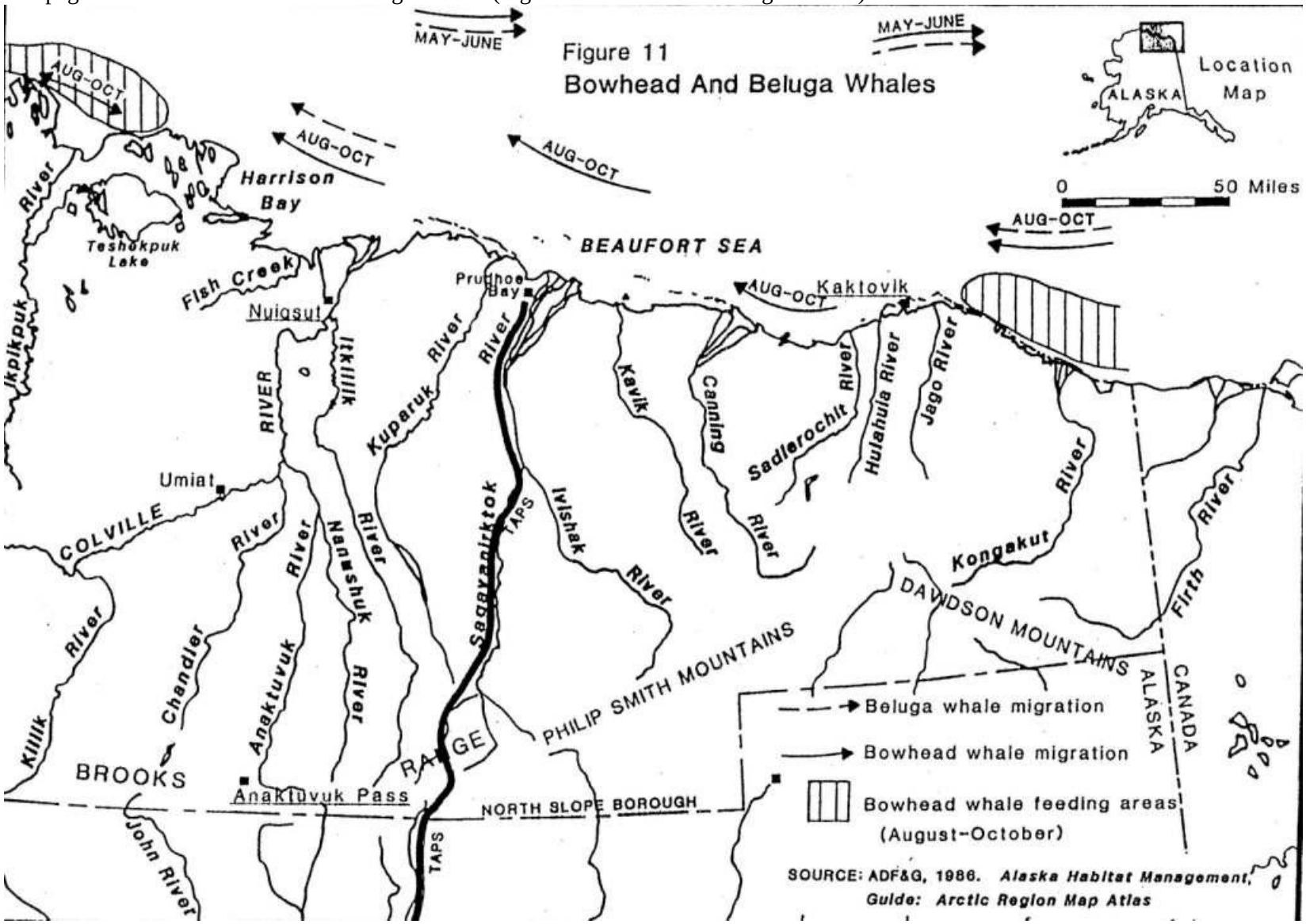
Moose Moose are found along the major river valleys of the North Slope, and are common in between and including the Colville and Canning River drainages. Moose may be found from the mountains of the Brooks Range onto the coastal plain, although they are more common in the foothills. Important habitat for moose includes riparian willow stands along the major rivers and tributary streams, particularly during winter. Calving occurs in late May and early June.

Dall Sheep Dall sheep are found throughout the Brooks Range from the Alaska-Canada border to the Wulik Peaks area of the extreme western end of the range. Small groups of sheep may be found on isolated mountains (e.g., Slope Mountain along the Dalton Highway) in the transition area between the mountain and the foothills provinces. Sheep often concentrate during winter on windblown slopes and ridges along major river valleys where shallow snow cover allows feeding on low-growing plants. During summer, sheep disperse to smaller valleys, mountain peaks, and other areas inaccessible to them during

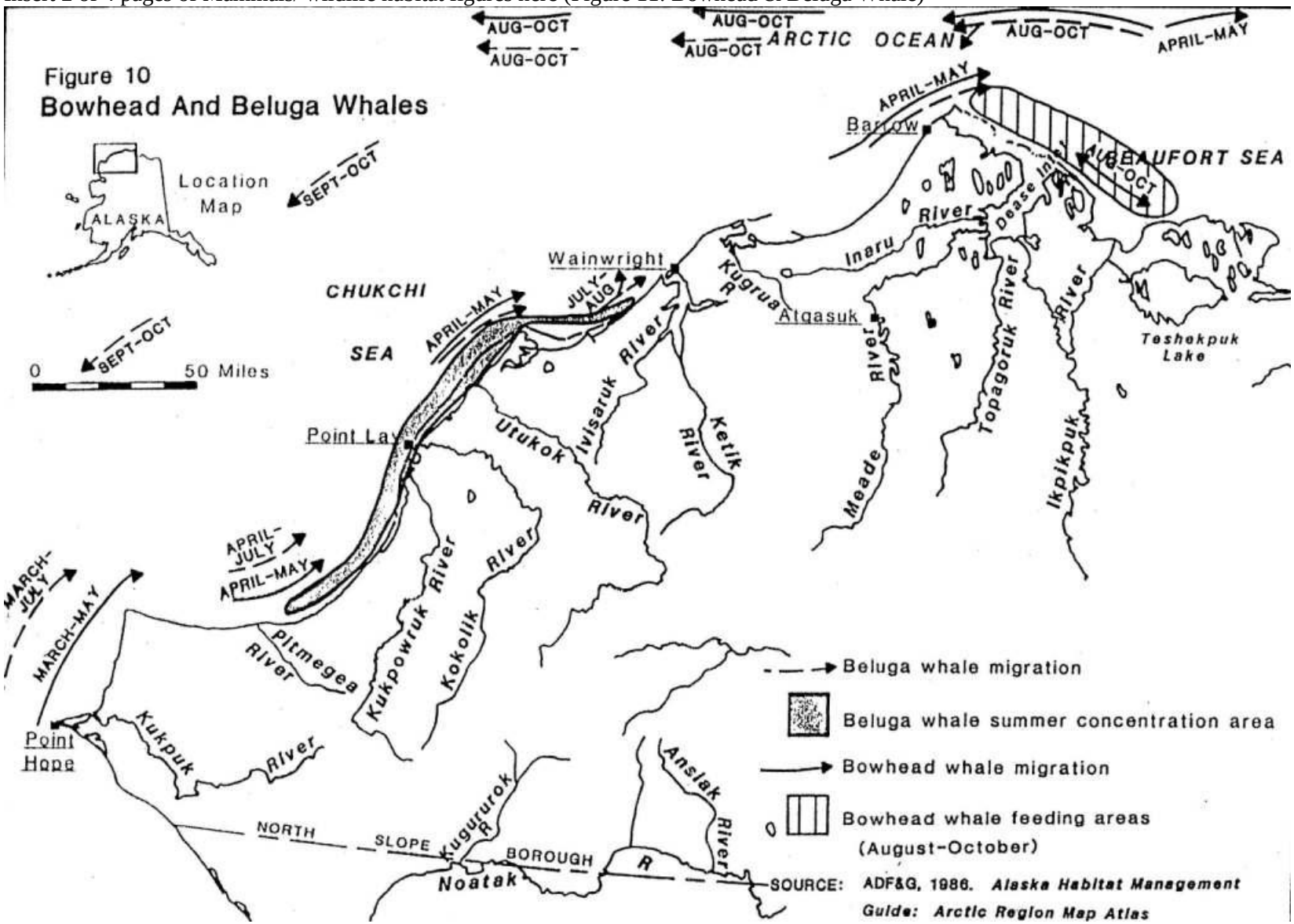
winter. Mineral licks are important habitat used primarily from late May through mid-July, although sheep may be seen at these sites from April through October. Lambing occurs mid-May through mid-June.

Wolves and Foxes Wolves and foxes are found throughout the North Slope Subarea. Arctic foxes generally occupy coastal areas, whereas red foxes generally occupy inland areas. Some red foxes do occur and den near the coast. Wolves and foxes select den sites where unfrozen, well-drained soils occur (e.g., dunes, river banks, moraines, pingos). Wolves may initiate den construction in mid-April. Pups are born from mid-May through early June, and generally leave the den by mid-July, although dens may be occupied until August. Arctic and red foxes have a reproductive pattern similar to that of wolves.

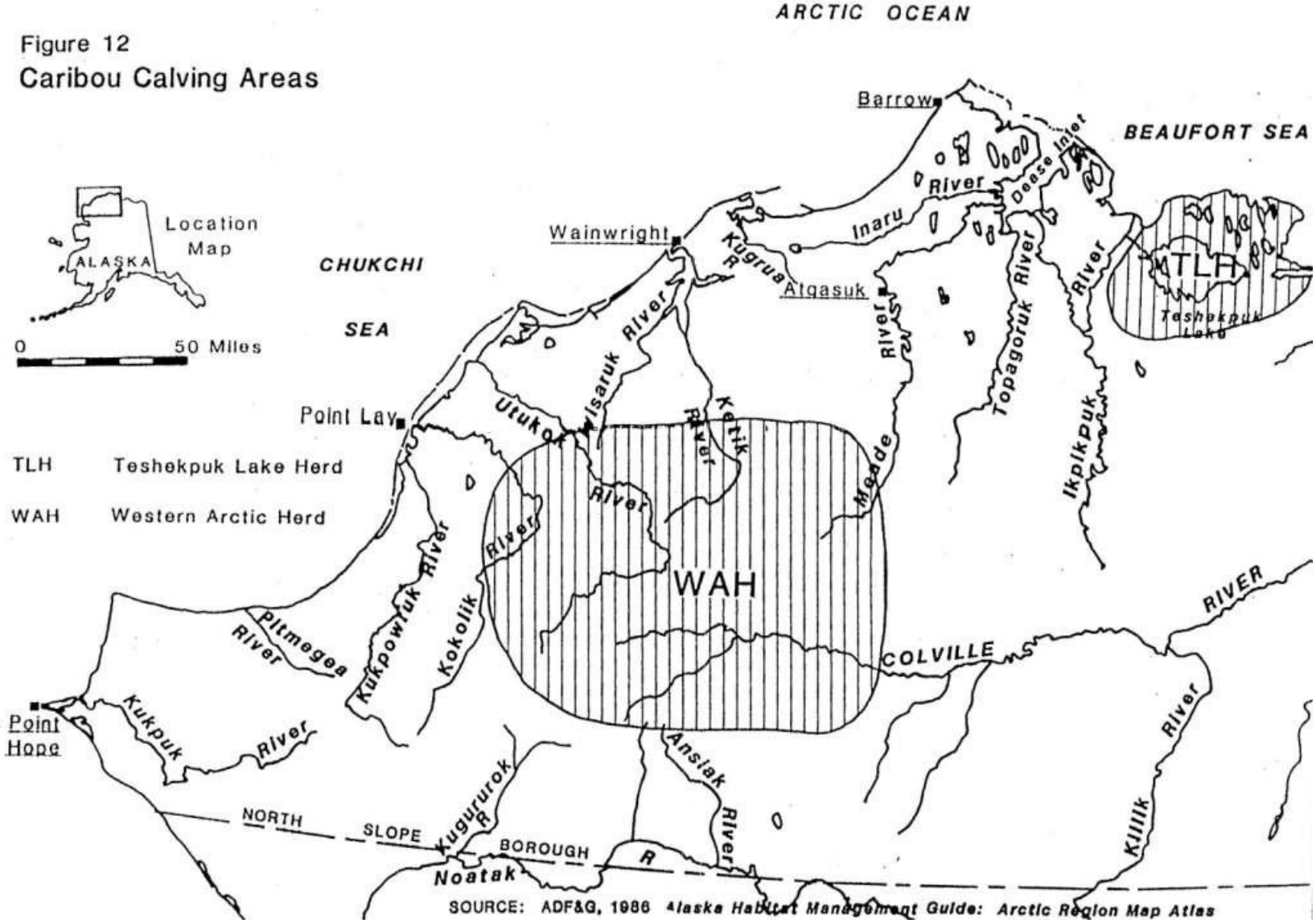
Insert 1 of 4 pages of Mammals/ wildlife habitat figures here (Figure 10: Bowhead & Beluga Whales)



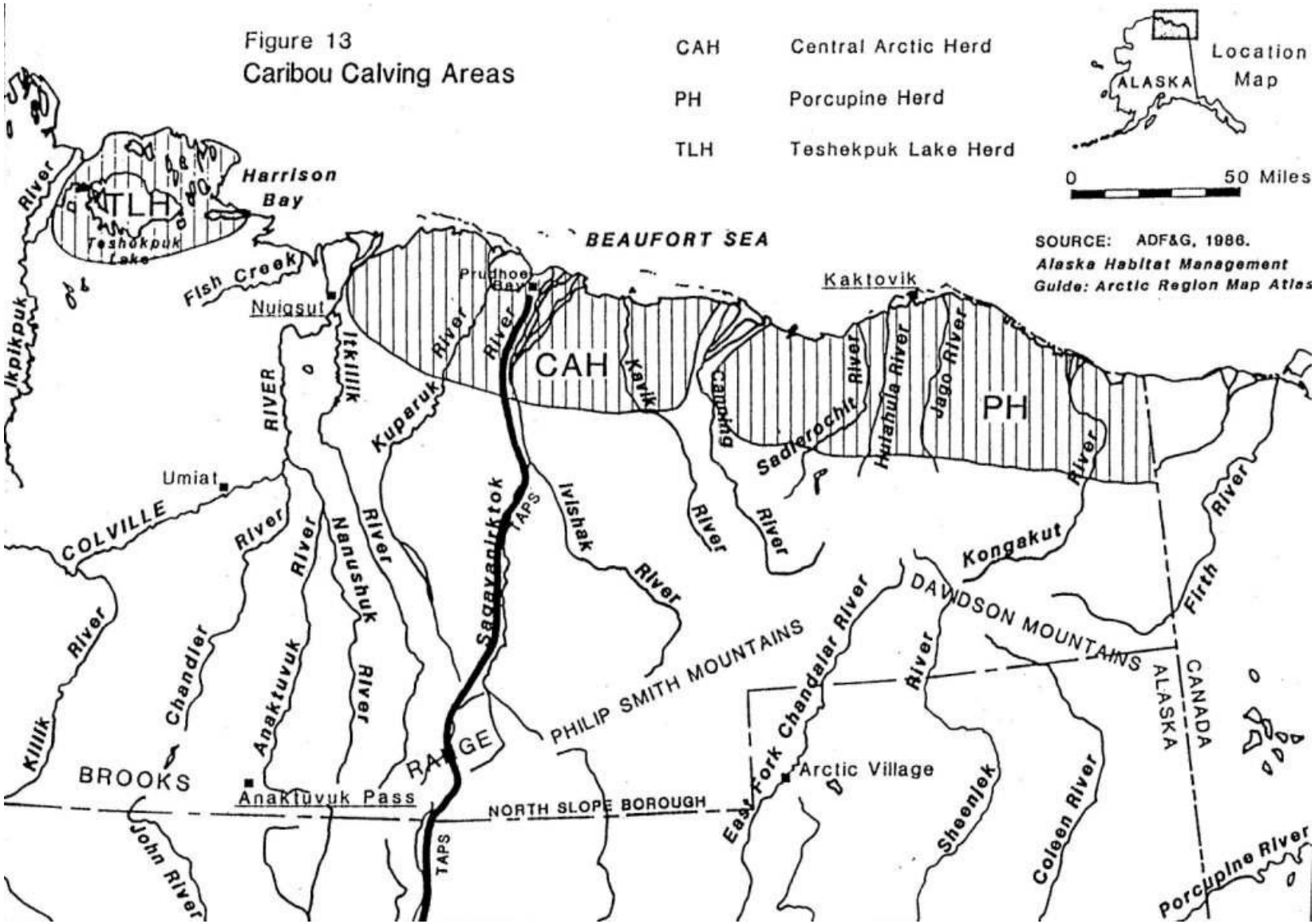
Insert 2 of 4 pages of Mammals/ wildlife habitat figures here (Figure 11: Bowhead & Beluga Whale)



Insert 3 of 4 pages of Mammals/ wildlife habitat figures here (Figure 12: caribou calving areas)



Insert 4 of 4 pages of Mammals/ wildlife habitat figures here (Figure 13: caribou calving areas)



3. Vegetation

Rare plant species are identified below, as documented by the Alaska Natural Heritage Program. The map on the following page identifies the general locations of these rare plants.

Rare Plants Known From the North Slope Subarea			
Global Rank	**State Rank**	**Scientific Name**	**Common Name**
G3G4	S3S4	Astragulus nutzotinensis	A milk vetch
G4T3T4	S2S3	Cardamine microphylla ssp. blaisdellii	Small-leaf bittercress
G3T3T4Q	S2	Cardamine microphylla ssp. microphylla	Small-leaf bittercress
G5	S3	Carex atherodes	Awned sedge
G4	S2S3	Carex heleonastes	Hudson Bay sedge
G4?	S2	Carex holostoma	Arctic marsh sedge
G4	S3	Cerastium regelii	
G2G4q	S2S4	Claytonia porsildii	
G3?	S2S3	Colopodium wrightii	
G4	S2S3	Colpodium vahlianum	
G5T5	S2S3	Cypripedium calceolus ssp parviflora	
G4	S1S2	Draba adamsii	
GNR	S1S2	Draba micropetala	
G4G5	S4	Draba palanderiana	Palander's whitlow grass
G4	S1	Draba pauciflora	Fewflower draba
G3G4	S1S2	Draba porsildii	
G4	S1	Draba subcapitata	Ellesmereland whitlowgrass
G5T4T5	S1	Erigeron acris var kamtschaticus	
G2	S2	Erigeron muirii	Muir's fleabane
G5	S2	Erigeron ochroleucus	Buff fleabane
G4T3T4	S3	Erigeron porsildii	Largeflower fleabane
G2G3	S2	Eurybia pygmaea	
G3G4	S1	Festuca edlundiae	none
G4	S2S3	Koeleria asiatica	Eurasian Junegrass
G2Q	S2	Mertensia drummondii	Drummond's bluebells
G3	S3	Montia bostockii	Bostock's miners lettuce
G4G5	S2S3	Oxygraphis glacialis	Kamchatka buttercup
G4?T2T3Q	S2S3	Oxytropis arctica var barnebyana	Barneby's locoweed
G3G4	S3S4	Oxytropis scammaniana	Scamman's crazy-weed
G2G3Q	S2S3	Oxytropis tananensis	Field locoweed
G3G4	S3	Papaver alboroseum	
G3	S2S3	Papaver gorodkovii	
G3	S3	Papaver walpolei	
G5?	S1	Pedicularis hirsuta	Hairy lousewort
G4G5	S1	Pleuropogon sabinei	False semaphoregrass
G3G4T1	S1	Poa hartzii ssp. alaskana	Alaskan bluegrass
G4	S2S3	Potentilla rubricaulis	Rocky mountain cinquefoil
G5	S1S2	Potentilla stipularis	Stipulated cinquefoil
G4	S2S3	Puccinellia vahliana	Vahl's Alkali grass
G3G4	S2S3	Puccinellia wrightii	Wright's alkaligrass
G4T3T4	S2	Ranunculus glacialis var. chamissonis	Glacier buttercup

Rare Plants Known From the North Slope Subarea			
Global Rank	**State Rank**	**Scientific Name**	**Common Name**
G4	S1	Ranunculus sabinei	Sardinian buttercup
G2	S2	Rumex krausei	
G4	S3S4	Salix chamissonis	A willow
G5	S1	Saxifraga aizoides	Yellow mountain saxifrage
G5T2T3Q	S2S3	Smelowskia calycina var porsildii	Porsild's false candytuft
G2G3Q	S2S3	Smelowskia media	Fernleaf false candytuft
G3	S3	Stellaria alaskana	
G5	S2S3	Stellaria umbellata	Umbellate chickweed
G3	S3	Symphyotrichum yukonense	Yukon aster
G3	S3	Thlaspi arcticum	Arctic pennycress
G5T4Q	S2	Trisetum sibiricum ssp. litorale	Siberian oatgrass

Species Ranks used by The Alaska Natural Heritage Program:

Species Global Rankings

G1: Critically imperiled globally. (typically 5 or fewer occurrences)

G2: Imperiled globally. (6-20 occurrences)

G3: Rare or uncommon globally. (21-100 occurrences)

G4: Apparently secure globally, but cause for long-term concern (usually more than 100 occurrences)

G5 Demonstrably secure globally

G#G#: Rank of species uncertain, best described as a range between the two ranks.

G#Q: Taxonomically questionable.

G#T#: Global rank of species and global rank of the described variety or subspecies of the species.

Species State Rankings

S1: Critically imperiled in state. (usually 5 or fewer occurrences)

S2: Imperiled in state. (6-20 occurrences)

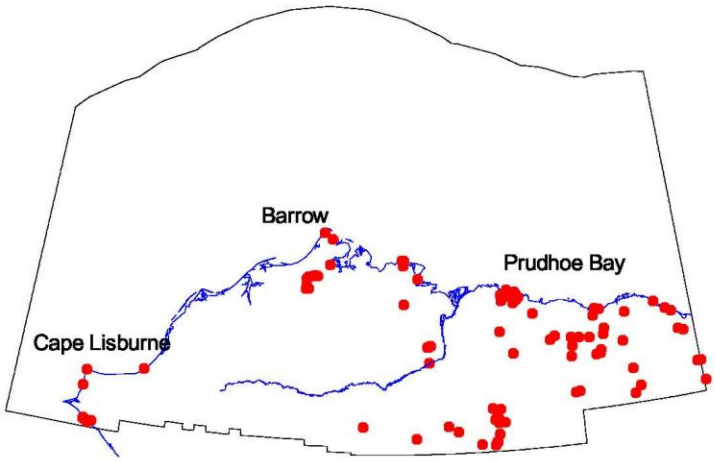
S3: Rare or uncommon in state. (21-100 occurrences)

S4: Apparently secure in state, but with cause for long-term concern (usually more than 100 occurrences)

S5: Demonstrably secure in state.

S#S#: State rank of species uncertain, best described as a range between the two ranks.

Known Rare Plant Locations for the Northslope Subarea Contingency Plan



Source Data: University of Alaska
Alaska Natural Heritage Program
Biological Conservation Database

D HUMAN USE RESOURCES

1. Fish Hatcheries and Associated Ocean Net Pens

There are no hatcheries or pens on the North Slope.

2. Aquaculture Sites

There are no sites on the North Slope.

3. Cultural Resources

The North Slope Subarea contains a multitude of known and unidentified archaeological and historic sites. Oil spills and hazardous substance releases may result in direct and/or indirect impacts to those cultural resources. Federal On-Scene Coordinators (FOSC) are responsible for ensuring that response actions take the protection of cultural resources into account and that the statutory requirements for protecting cultural resources are met. Annex M of the Unified Plan outlines FOSC responsibilities for protecting cultural resources and provides an expedited process for compliance with Section 106 of the National Historic Preservation Act during the emergency phase of a response.

4. Subsistence and Personal Use Harvest

Subsistence-related uses of natural resources play an important role in the economy and culture of many communities in the North Slope Subarea. A subsistence economy may be defined as follows:

> ...an economy in which the customary and traditional uses of fish, wildlife and plant resources contribute substantially to the social, cultural and economic welfare of families in the form of food, clothing, transportation and handicrafts. Sharing of resources, kinship-based production, small scale technology and the dissemination of information about subsistence across generational lines are additional characteristics.

Before 1990, the State of Alaska and the Alaska Boards of Fisheries and Game made all decisions regarding the management of subsistence resources and harvest rights. In 1990, however, the federal government became responsible for assuring a federal subsistence priority on federal public lands, and in 1999 on federal reserved waters. The Federal Subsistence Board adopts subsistence regulations that are administered by the various federal agencies on federal public lands. State regulations still apply to state and private lands and for non-subsistence harvests on all lands. As a consequence, the number of agencies involved in managing subsistence resources and uses has increased. Therefore, in the event of a spill, extensive coordination will be required in order to address subsistence resources. Regulations regarding subsistence harvest can also be expected to undergo regular modification. Current information on harvest regulations can be obtained from the Alaska Department of Fish and Game Subsistence Division or the U.S. Fish and Wildlife Service Office of Subsistence Management.

Traditional subsistence harvest areas for Atqasuk, Nuiqsut,Point Hope, and Wainwright (Figure 14) and Anaktuvuk Pass, Barrow, Kaktovik, and Point Lay (Figure 15) and are shown in the figures below.

5. Commercial Fishing

The only commercial fishery in the North Slope Subarea is a family-run operation located near the mouth of the Colville River, targeting least and Arctic cisco. Fishing is done during October and November and utilizes nets strung underneath the river ice. As fishing periods are adjusted yearly by emergency openings and closures, contact Alaska Department of Fish and Game for current fishing periods. Updated information may be found at their Commercial Fisheries web site:
http://www.adfg.alaska.gov/index.cfm?adfg=fishingCommercial.main

6. Sport Fishing and Hunting

Sport fishing and hunting may occur at a wide variety of locations in the subarea throughout the year. Seasons and harvest regulations vary, depending on the species and the area, and may be changed form year-to-year. Contact the Alaska Department of Fish and Game for current seasons within the area of a spill. Sport hunting on the Arctic National Wildlife Refuge is focused mainly on caribou, Dall sheep, and grizzly bear. Contact the Alaska Department of Fish and Game for current seasons within the area of the spill. Updated information may be found at their Sport Fish web site:
http://www.adfg.alaska.gov/index.cfm?adfg=fishingSport.main

7. Recreational Sites and Facilities

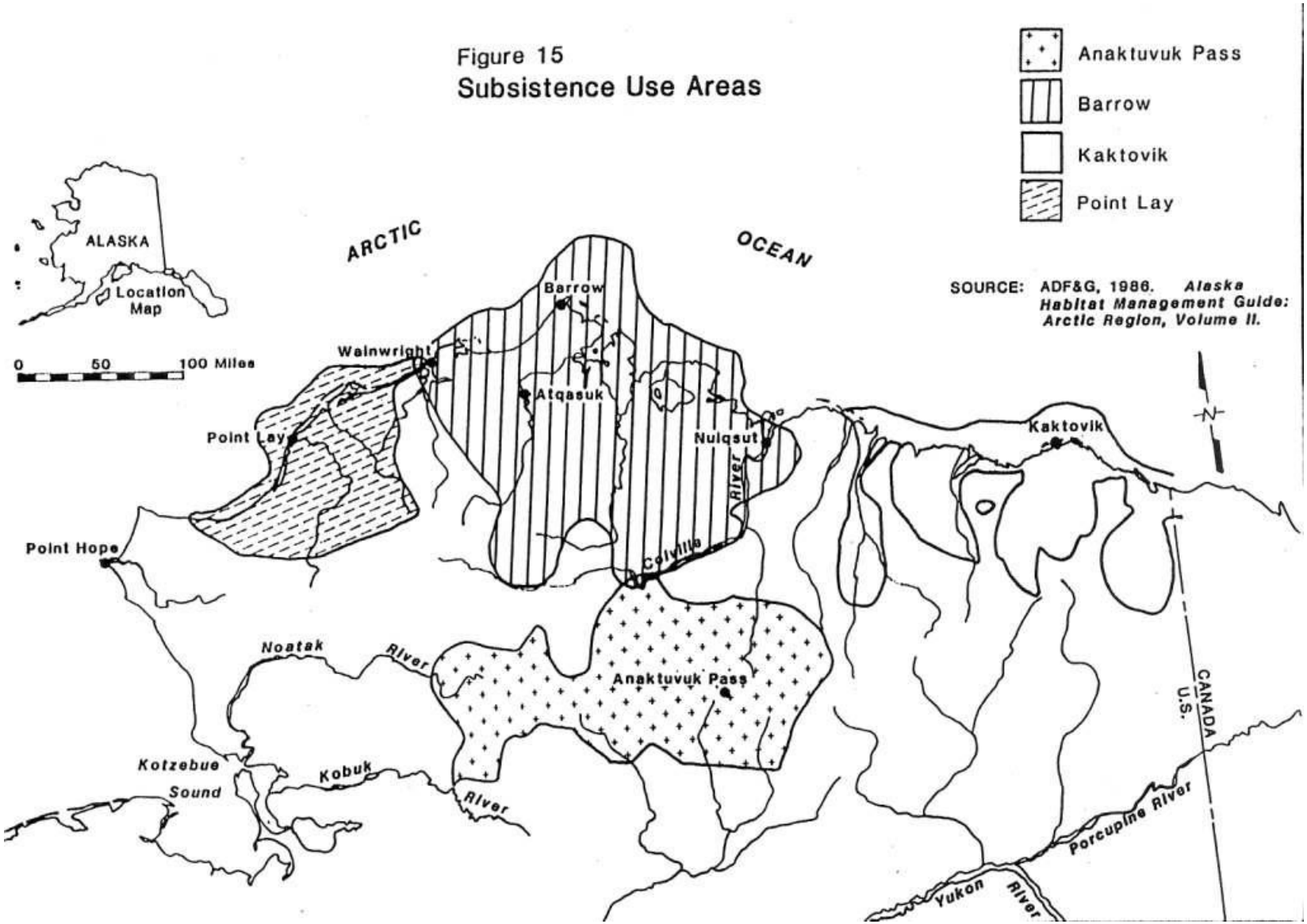
Touring and camping take place at informal locations along the Dalton Highway (haul road) from mid-June to September 1.

The Arctic National Wildlife Refuge River hosts river float trips, backpacking, wildlife viewing, and sport hunting activities. River float trips by small parties are common on the Hulahula, Kongakut, and designated Wild rivers: the Sheenjak, Ivishak, and Wind rivers.

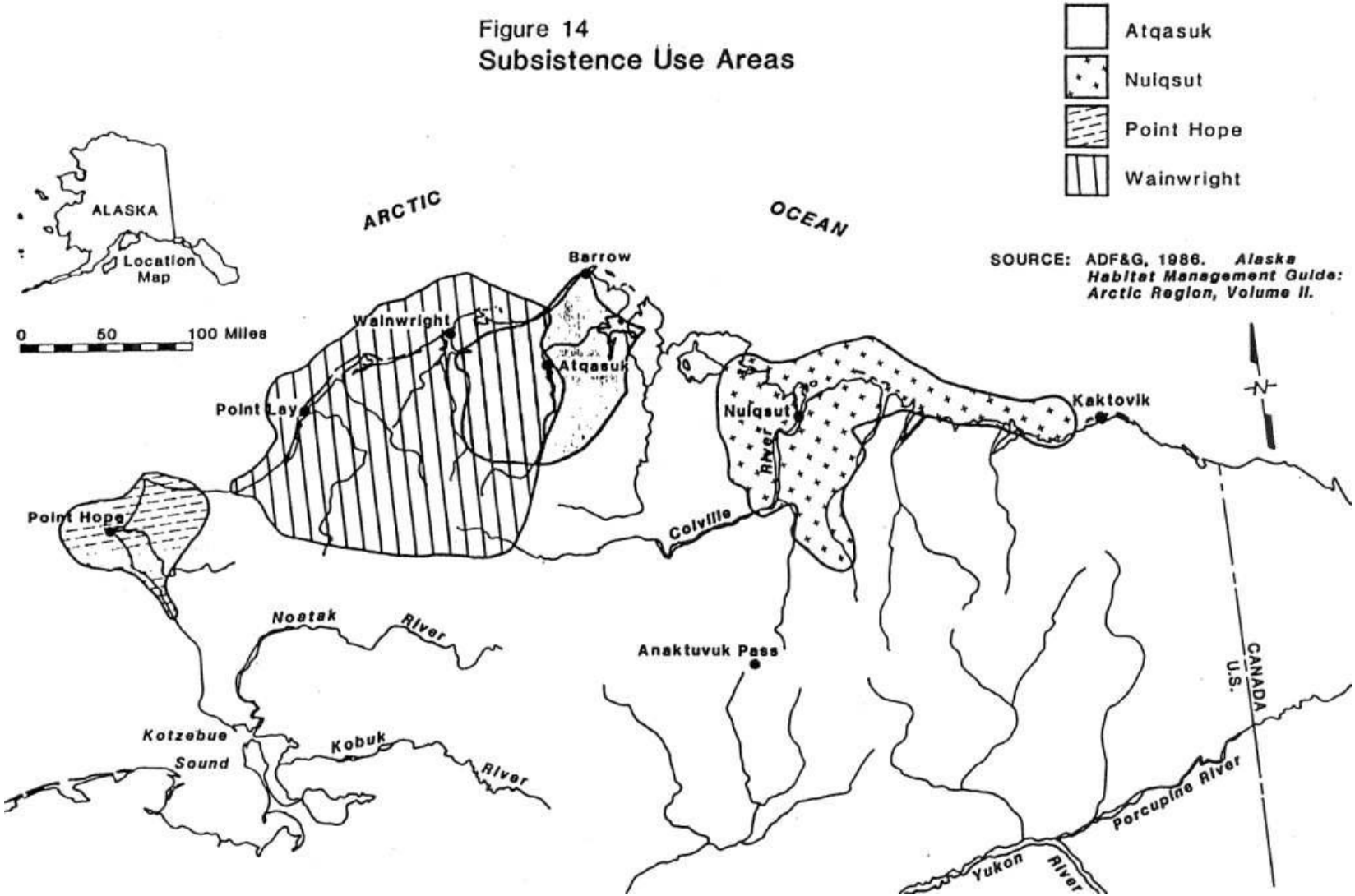
8. Commercial Tourism

Commercial tours are generally seasonal, in the ice-free months. Organized tours to Barrow, Prudhoe Bay, and along the haul road are most prevalent. Guided eco-tourism occurs mostly in the parks and refuges.

Insert Subsistence Use Area Figure 1 of 2 (jpg file)



Insert Subsistence Use Area Figure 2 of 2 (jpg file)



9. Marinas and Ports

(See the Resources Section)

10. Fish Processing

There are no known fish processing facilities in the subarea.

11. Logging Facilities

There are no known logging facilities in the subarea.

12. Water Intake/Use

The following information was generated by the Alaska Department of Environmental Conservation. Included are permitted water use facilities by index number, facility name, and facility location. The Alaska Division of Water's web site is: http://dec.alaska.gov/water/index.htm

Name of System	Location	State ID No.	Source
NSB SD - Nunamiut School	Anaktuvuk Pass	350049	Groundwater
NSBU - Anaktuvuk Pass	Anaktuvuk Pass	350057	Groundwater
NSBU - Atqasuk PWS	Atqasuk	320094	Surface
Barrow Utilities & Electric Coop	Barrow	320078	Surface
Inupiat Water Delivery	Barrow	320060	Purchased
UIC - NARL	Barrow	320052	
UIC - NARL - Bottled Water	Barrow	320816	
Water Services	Barrow	320230	
NSBU - Kaktovik	Kaktovik	320248	Surface
Waldo Arms	Kaktovik	320719	
NSBU - Nuiqsut	Nuiqsut	320264	Tagruk Lake
NSBU - Point Hope	Point Hope	320426	Surface
Point Hope Day Care	Point Hope	320662	
NSBU - Point Lay	Point Lay	320256	Eluiqinilik Lake
Alyeska Pipeline	Pump Station 1	333039	
Alyeska Pipeline	Pump Station 2	320214	
Alyeska Pipeline	Pump Station 3	320010	
Alyeska Pipeline	Pump Station 4	320036	
Toolik Field Station (BLM)	Toolik Lake		Groundwater
NSBU - Wainwright	Wainwright	320086	Merekruak Lake
Wainwright Coop	Wainwright	320769	

PART FIVE—LAND MANAGEMENT

A. LAND MANAGEMENT DESIGNATIONS

1. Access to Lands

Land ownership must be determined and landowners contacted to evaluate incident-specific protection priorities, obtain land-use permitting requirements, and obtain permission to access lands. Native corporation lands, as well as local, State, and Federal government lands often require special use permits. If an incident affects private lands or Native Allotments, permission to enter lands should be sought from the landowner. The local Borough government is often the best source of private land ownership records.

2. State

State owned lands extend from the Arctic National Wildlife Refuge to the National Petroleum Reserve and from Prudhoe Bay south and west along the TAPS pipeline corridor. There are no legislatively designated areas for special uses in the North Slope subarea. The State also owns submerged lands three miles out from most of the coastline.

3. Federal

Gates of the Arctic National Park and Preserve About 250 miles northwest of Fairbanks, the Gates of the Arctic was established in 1980 and encompasses approximately 7,952,000 acres. The area is managed to protect its wild and undeveloped character, for mountaineering and wilderness recreation, and to protect habitat and wildlife. Subsistence uses are permitted for local residents. Caribou, moose, Dall sheep, grizzly bear, wolves and raptors are in abundance. The Tinayguk/North Fork, John, upper Alatna, upper Kobuk, and Noatak rivers are nationally designated Wild and Scenic Rivers. Web page: http://www.nps.gov/gaar/index.htm

Noatak National Preserve The Noatak encompasses approximately 6,460,000 acres and was created in 1980 to protect wildlife, habitat, and archeological resources, and provide opportunities for scientific research. The Noatak River is a nationally designated Wild and Scenic River. Web page: http://home.nps.gov/noat/index.htm

Arctic National Wildlife Refuge The 19,049,236 acre Refuge extends from the Brooks Range north to the Arctic coastal plain and east to the Canadian border, and includes the range of the Porcupine caribou herd (about 152,000 animals in 1994). The Refuge also supports musk ox, Dall sheep, wolves, wolverines, grizzly and polar bears, and over 140 species of birds. Snow blankets the ground 9 months of the year and permafrost is near the surface of the ground. The upper Sheenjek and Wind Rivers are nationally designated Wild and Scenic Rivers. Float trips, sport fishing, backpacking, hunting, wildlife viewing, and subsistence are primary Refuge activities. Web page: http://www.fws.gov/refuges/profiles/index.cfm?id=75600

Alaska Maritime National Wildlife Refuge Alaska Maritime National Wildlife Refuge (Refuge) areas at Cape Lisburne and at Cape Thompson, plus public lands on islands, islets, rocks, reefs, sandy barrier islands, and spires in the Chukchi Sea make up the Chukchi Sea Unit of the Refuge. The Refuge consists of over 2,400 islands, headlands, rocks, islets, spires, and reefs along the Alaskan coast, stretching from Southeast Alaska to Cape Lisburne on the Chukchi Sea. The Refuge is synonymous with seabirds. About 75 percent of Alaska's marine birds (15 to 30 million of 55 species) use the complete Refuge. Cape

Thompson and nearby Cape Lisburne are the two largest arctic seabird colonies in the United States with over 1 million nesting seabirds. For some birds such as cormorants, this is as far north as they nest. Arctic-adapted black guillemots replace pigeon guillemots at these northern latitudes; however, a few pigeon guillemots nest at Cape Thompson. Only black guillemots nest at Cape Lisburne, 50 miles north. Several thousand common eiders nest in colonies along the barrier islands and islets of the Chukchi Sea Unit. Portions of the Refuge are also home to sea lions, seals, walrus, polar bear, and sea otters. Wildlife viewing, photography, backpacking, and subsistence are primary uses of the Refuge. Web page: http://alaska.fws.gov/nwr/akmar/index.htm

National Petroleum Reserve in Alaska The National Petroleum Reserve in Alaska (NPRA) lies between the Brooks Range and the Arctic Ocean, west of the Colville River. It is a 23 million acre tract, with significant Arctic wetland ecosystems that support black brant, Canada geese, pintail ducks, tundra swans, greater whitefronted geese, the entire North American population of Steller's eiders, a significant percentage of the world's population of spectacled eiders, and shorebirds. Other riverine habitat support arctic peregrine falcons and other raptors, moose, fur-bearers and overwintering fish. Upland areas support caribou (450,000+), Dall sheep, musk oxen, and barren ground grizzly bear. Polar bear denning occurs along the northern portions of NPRA along bluffs and inland along river and creek drainages where sufficient snow accumulates. Cultural values include more than a thousand historic and prehistoric sites. Paleontological values in the form of dinosaur beds which contain six of the seven known Alaska dinosaurs are also present. Recreation includes adventure tourism, river running, watchable wildlife, and tundra trekking. Subsistence and oil and gas exploration are also uses of NPRA. Web page: http://www.blm.gov/ak/st/en/prog/energy/oil_gas/npra.html

A 1998 *Final Integrated Activity Plan/Environmental Impact Statement* prepared by the Bureau of Land Management and Minerals Management Service for the northeast portion of NPRA identified sensitive resources and use areas (see following map). This was amended in January 2005. An EIS was completed for the northwest NPRA planning area in November 2003. Special Areas within NPRA include:

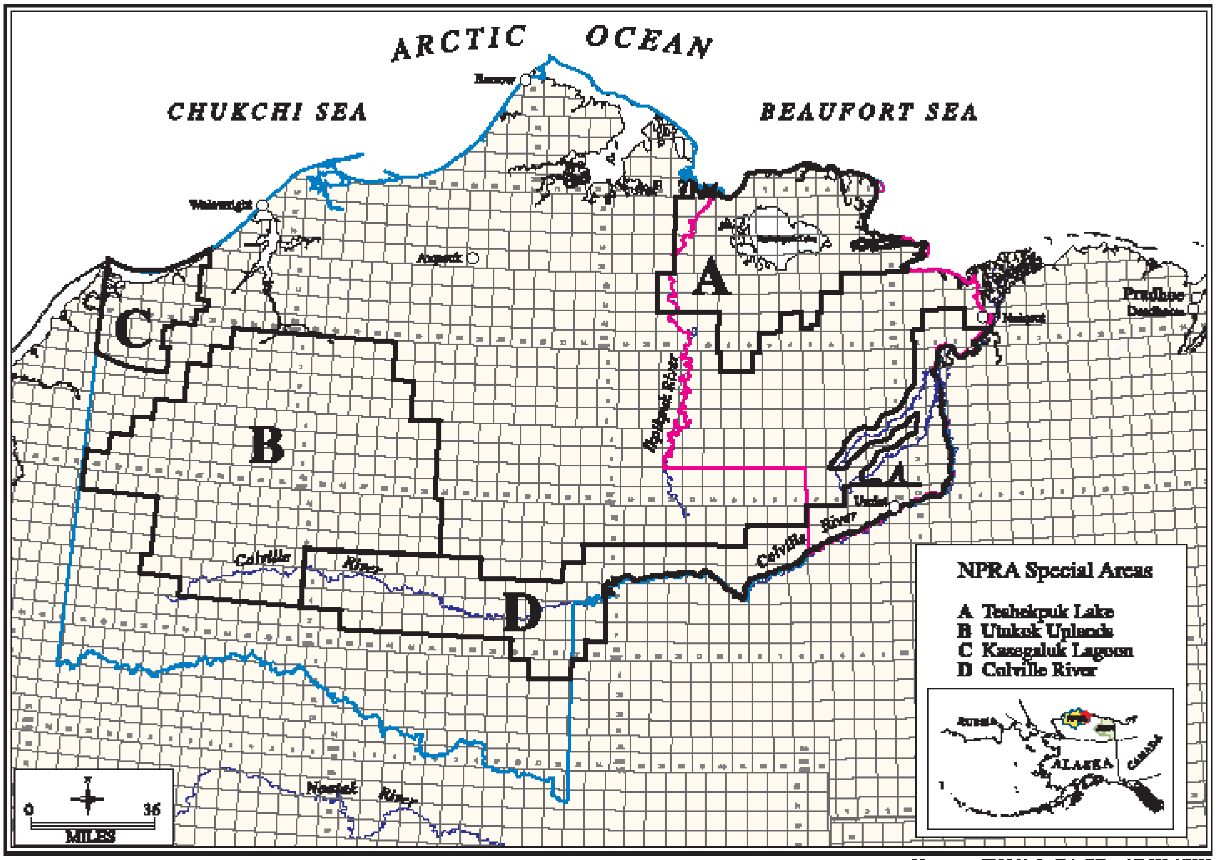
- Utukok Uplands Special Area This area of about 4 million acres provides crucial habitat for feeding and calving for the Western Arctic caribou herd, which is dependent on the area vegetation. A high concentration of grizzly bears in the area depend upon a prey base supported by the moist tundra and alpine tundra communities, which dominate.

- Teshekpuk Lake Special Area This 1.7 million acre area is crucial habitat for extremely high concentrations of nesting, molting, and pre-migration staging waterfowl. The area also supports a resident caribou herd dependent upon the wet tundra community.

- Colville River Special Area This area of about 2.3 million acres is known for its raptors, such as the arctic peregrine falcon, which depend upon a prey base supported by the high brush community along the river. Moose, caribou, grizzly bears, waterfowl, and shorebirds are attracted to the area because of the rich vegetation and the fauna it supports.

- Kasegaluk Lagoon This is an outstanding example of a barrier island lagoon environment. There are large concentrations of waterfowl that stage and feed prior to migrating south. Numerous marine mammals, such as beluga whales, feed in the area.

The figure on the following page illustrates the locations of the NPRA Special Areas.



Map source: BLM Alaska State Office, AK-930, 1/2000

Trans-Alaskan Pipeline Utility Corridor:

- Toolik Lake Area of Critical Environmental Concern/Research Natural Area Toolik Lake Area contains 82,800 acres and has a large number of research projects related to the Long Term Ecological Research efforts of the U. S. and the international community. These research projects have produced valuable information concerning the resources on the North Slope and other Arctic environments. A sensitive plant species, *Montia bostockii*, is found in the Toolik Lake area.

- Galbraith Lake Area of Critical Environmental Concern This area encompasses 56,000 acres and has the highest concentration of historic and prehistoric cultural resources of any region yet inventoried along the Corridor. Three of these sites have been nominated to the National Register of Historic Places, with more potentially eligible. The area is crucial for lambing and mineral licks for Dall sheep. The northern side of the Brooks Range, north of Atigun Pass, has high scenic values and remarkable geology and paleontology.

- West Fork Atigun Area of Critical Environmental Concern These 8,500 acres are designated sensitive for the use by Dall sheep for lambing and the availability of mineral licks.

- Chandalar Shelf Development Node These 1,700 acres have administrative facilities for BLM and State of Alaska DOT. This area is the proposed location for any road service related commercial facilities that may be required in the future.

- Vulnerable Areas Downstream from TAPS Utility Corridor See Attachment One for rivers, creeks and significant bodies of water in geographical order along the Trans-Alaska Pipeline System Utility Corridor from North to South within the subarea.

- See the web page at: http://www.jpo.doi.gov/TAPS/TAPS.htm

B. LAND MANAGEMENT MAPS

The Alaska Department of Natural Resources, under agreement with the Alaska Department of Environmental Conservation, produced digital base and land management maps for each of the subareas using their ARC-INFO based Geographic Information System. The following land management maps provide an index to the Public Land Record and should not be viewed as legal documents. These maps are available on the internet at: http://www.asgdc.state.ak.us/maps/cplans/subareas.html

For more current detailed information on land status, go to the Bureau of Land Management's Spatial Data Management System web site at: http://sdms.ak.blm.gov/isdms/imf.jsp?site=sdms and click on the Generalized Land Status layer.

Insert land management index map here

http://www.asgdc.state.ak.us/maps/cplans/base/LegendPage.pdf

Insert land management designations map here--1 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns11n3.pdf

Insert land management designations map here--2 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns21n3.pdf

Insert land management designations map here--3 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns31n3.pdf

Insert land management designations map here--4 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns41n3.pdf

Insert land management designations map here--5 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns51n3.pdf

Insert land management designations map here--6 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns61n3.pdf

Insert land management designations map here--7 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns71n3.pdf

Insert land management designations map here--8 of 8 pages

http://www.asgdc.state.ak.us/maps/cplans/ns/ns81n3.pdf

ATTACHMENT ONE

U.S. BUREAU OF LAND MANAGEMENT

Fish Streams Along the Trans-Alaska Pipeline System

The following are excerpts of information generated by the U.S. Bureau of Land Management and presented in "Fish Streams Along the Trans-Alaska Pipeline System: A Compilation of Selected References With Current TAPS Stationing," BLM Open File Report 105 (Fourth Edition) December 2005.

Fish Species Codes (Adapted from Johnson and Rockwell, 1981)		
?	Fish Present?	
AB	Alaska blackfish	Dallia pectoralis
AC	Arctic char	Salvelinus alpinus
AL	Arctic lamprey	Lampetra japonica
AS	American shad	Alosa sapidissima
RB	Burbot	Lota lota
BC	Bering cisco	Coregonus laurettae
BL	American brook lamprey	Lampetra sp.
BW	Broad whitefish	Coregonus nasus
CA	Arctic cisco	Coregonus autumnalis
CD	Sculpin	Family: Cottidae
CI	Cisco	Coregonus sp.
CN	Slimy sculpin	Cottus cognatus
CS	Least cisco	Coregonus sardinella
CT	Cutthroat trout	Oncorhynchus clarkii
DS	Chum (dog) salmon	Oncorhynchus keta
DV	Dolly Varden	Salvelinus malma
GR	Arctic grayling	Thymallus arcticus
HO	Pond smelt	Hypomesus olidus
HW	Humpback whitefish	Coregonus pidschian
IN	Inconnu (sheefish)	Stenodus leucichthys
KO	Kokanee	Oncorhynchus nerka
KS	Chinook (king) salmon	Oncorhynchus tshawvtscha
LC	Lake chub	Couesius plumbeus
LS	Longnose sucker	Catostomus catostomus
LT	Lake trout	Salvelinus namaycush
LW	Lake whitefish	Coregonus clupeaformis
NP	Northern pike	Esox lucius
OM	Rainbow smelt	Osmerus mordax

Fish Species Codes (Adapted from Johnson and Rockwell, 1981)		
PS	Pink (humpback) salmon	Oncorhynchus gorbuscha
PW	Pygmy whitefish	Prosopium coulteri
RB	Rainbow trout	Oncorhynchus mykiss
RS	Sockeye (red) salmon	Oncorhynchus nerka
RW	Round whitefish	Prosopium cylindraceum
SR	Stickleback	Family: Gasterosteidae
S9	Ninespine stickleback	Pungitius pungitius
SH	Steelhead trout	Oncorhynchus mykiss
SK	Sucker	Family: Catostomidae
SS	Coho (silver) salmon	Oncorhynchus kisutch
TP	Trout —Perch	Percopsis omiscomaycus
WF	Whitefish	Coregonus sp.

EXPLANATION OF HEADINGS

SECTION 00 BPM OPEN FILE REPORT – TAPS FISH STREAMS 04/01/87 PAGE 00 OF 00

MP	STREAM NAME(s)	FISH SPECIES	A D	JaFeMrApMaJuJlAuSeOcNoDe PERIOD OF SENSITIVITY	FIELD STATION	MER T	REFER -ENCE
A/S	Comments		A		G-5	R	
			D			SEC	
4.12	(Edge) Lakes	?			21736 21796	U 10N	AB E F
1.37	TAPS A/G; Causeway				1550+00 1541+70	14E 20	
277.14	PROSPECT CREEK	CN;GR;KS LS;NP;RW	Y E S	CCCCCCCCCCCCCCCCCC	1463150 1463408	F 22n	AB E FG
91	TAPSA/G;BLOCKPOINT				1590++00	14w 31	
*790.9	(Grey Stream)	DV; SS		CCCCSSSSSSSSjlauCCCCC	4176212	C 09S	AB E
2	TAPS B/G; CMP				506+06	05W 28	

ABBREVIATIONS:

SECTION 00 = Section 01 is Pump Station. 1 to Pump Station. 2; Section 10 is Pump Station. 10 to Pump Station 11.

MP = The distance in miles from Pump Station 1; *Prefix denotes extrapolated mileage not field checked.

AS = Alyeska Pipeline Service Company (G-100 as-builts) alignment sheet number.

STREAM NAME = Adapted from Johnson and Rockwell, 1981. For example: YUKON RIVER denotes a name recognized by the U.S. Geological Survey; (Small or Jackie's CK) denotes a non-USGS recognized popular name; [Snowpad CK] denotes a new name used in this list.

COMMENTS = TAPS A/G denotes above-ground pipe mode; TAPS B/G denotes below-ground mode; CMP is a corrugated-metal-pipe or culvert; LWC is a low water crossing; BLOCKPOINT is a physical barrier to vehicle passage; CAUSEWAY, BRIDGE, and PARALLEL are self-explanatory.

FISH SPECIES CODES = Adapted from Johnson and Rockwell, 1981. See explanation of codes.

ADAD = "YES" denotes anadromous fish stream designated by Alaska Dept. Fish and Game.

PERIOD OF SENSITIVITY = C denotes Critical period of fish usage; S denotes Sensitive period of fish usage. NOTE: UNDERLINING of a stream's period of sensitivity denotes the recommended sensitivity period if fish return in the future.

FIELD STATION = Distance in feet from Pump Station No 1 as estimated in field; * Prefix denotes an extrapolated stationing not field checked.

G-5 = Obtained from "Selected References" and refers to construction drawings.

MER = Meridian – U is Umiat; F is Fairbanks; C is Copper River.

T = Tier or Township; R = Range; Sec. = Section.

REFERENCE = see "Selected References"

SELECTED REFERENCES:

(A) Alaska Pipeline Office. 1977. Interim report on zones of restricted activity for fish and wildlife along the Trans-Alaska Pipeline. U.S. Dept. of the Interior. Anchorage. AK. (February 16, 1977: 37pp).

(B) Johnson, Richard L. and Julius Rockwell, Jr. (Revised by J. Rockwell, Jr.). 1981. List of streams and other water bodies along the Trans-Alaska oil pipeline route (Fourth Revision: Draft). U.S. Dept. of the Interior, Alaska Pipeline Office, Anchorage, AK (May 1, 1981).

(C) Elliott, George V. 1980. First interim report on the evaluation of stream crossings and effects of channel modifications on fishery resources along the route of the Trans-Alaska Pipeline. U.S. Fish and Wildlife Service, Anchorage, AK (June, 1980: 77pp).

(D) Elliott, George V. 1982. Final report on the evaluation of stream crossings and effects of channel modifications on fishery resources along the route of the Trans-Alaska Pipeline. U.S. Fish and Wildlife Service, Anchorage AK (March 1982: 110 pp).

(E) Office of Special Projects. 1982. [no title]. U.S. Bureau of Land Management, Anchorage, AK. (May 6, 1982). [This list is commonly referred to as Ken Hunt's list and includes comments from the Alaska Dept. of Fish and Game].

(F) Office of the Federal Inspector for ANGTS. 1984. List of fish stream data. Anchorage, AK (February 13, 1984: 50 pp).

(G) DenBeste, J. and P. McCart. 1984. Catalog of streams associated with the Trans Alaska pipeline System in the northern district. Volume IV. Prepared for Alyeska Pipeline Service Company by Aquatic Environments Inc., Anchorage, AK. (April 1984: 67 pp).

(H) Roberson, Kenneth. 1985 (letter of 12/18). [Comments on First Edition of 1/1/86]. Alaska Dept. of Fish and Game, Glennallen, AK.

(I) Alyeska Pipeline Service Co. 1986 (letter of May 12, No. 86-3642) [Comments on First Edition of 1/1/ 86]. Anchorage AK.

Anadromous Fishes: Alaska Department of Fish and Game, Habitat Division. 1985. Catalog of waters important for spawning, rearing or migration of anadromous fishes, as revised March 29, 1985 effective May 19, 1985; Regions II, V, and VI. Juneau, AK.

(J) Gnath, D.G., D.W. Lieb, and M. Wiedmer. 2002. Trans-Alaska Pipeline System 2002 Fish Habitat Survey. Alaska Department of Fish and Game, Habitat and Restoration Division, Technical Report No. 02-07, Anchorage, AK.

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
3. 3.90 1.37	(Edge) Lakes TAPS A/G; Causeway	?			20842 21314 1550+00 1541+70	U 10N 14E 20	A ,B, E, F
4.12 137	(Edge) Lakes TAPS A/G; LWC				21736 21796 1550+00 1541+70	U 10N 14E 20	A ,B, E, F
4.12 137	(Edge) Lakes TAPS A/G; Causeway				21496 21976 1550+00 1541+70	U 10N 14E 20	A ,B, E, F
5.19 137	(Grayling Gulch) TAPS A/G; BLOCKPOINT	S9		jafemrapSSSSSSSSSeocnode	26939 27159 1478+52	U 10N 14E 29	A ,B, E, F
11.08 136	Unnamed Lake TAPS A/G; LWC	S9		jafemrapSSSSSSSSSeocnode	58498 58558	U 19N 14E 28	J
17.99 135	(Low Life CK) TAPS B/G; LWC	S9		jafemrapSSSSSSSSSeocnode	94930 825+00	U 08N 14E 28	E, F
20.50 22.41 134	SAGAVANIRKTOK RIVER SIDE CHANNELS and FLOODPLAIN TAPS B/G; LWCs	AC? CN GR, RW	Y E S	jafemrapCCCCSSauseocnode Sag River mainstem system and all side channels are specified as being important for the spawning, rearing or migration of anadromous fish.	108528 118300 5479+00 5396+10	U 17N 14E 8, 17, 18 & 19	A ,B, E, F
134	Pond TAPS B/G;PARALLEL ONLY TAPS DOES NOT CROSS	GR		jafemrapCCCCSSauseocnode	5388+33 5383+55	U 17N 14E 19	B

Section MP / A/S	Stream Name(s) / Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
134	Pond TAPS B/G;PARALLEL ONLY TAPS DOES NOT CROSS	GR		jafemrapCCCCSSauseocnode	5374+75 5370+50	U 17N 14E 19	B
24.03 134	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	126900 5296+83	U 07N 14E 30	A, B, F
24.91 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	131525 5251+61	U 07N 14E 31	A ,B, E, F
25.10 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	132525 5241+61	U 07N 14E 31	F
25.15 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	132810 5238+76	U 07N 14E 31	F
25.53 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	134950 5210+93	U 06N 14E 06	A, B
25.63 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?GR		jafemrapCCCCSSauseocnode	135300 5207+43	U 06N 14E 06	E
27.70 28.80 133	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC; BB? BW? CN? GR? RW? S9?		jafemrapCCCCSSauseocnode	146100 152500 5103+20	U 06N 13E 13&24	A ,B, E, F
29.67 30.45 132	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC; BB? BW?CN? GR; GR; RW? S9?		jafemrapCCCCSSauseocnode	156400 160750 4951+44	U 06N 14E 30	A ,B, E, F

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
30.44 132	(Thelma CK) TAPS B/G; LWC	AC;CN?; GR; S9		jafemrapCCCCSSauseocnode	160750 4951+44	U 06N 14E 30	F
32.90 132	SAGAVANIRKTOK RIVER SIDE CHAN (Short CK) TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	173600 4829+00 4827+89 4822+31	U 05N 14E 07	A, E A, B, E, F
33.40 132	SAGAVANIRKTOK RIVER SIDE CHAN (Sylvia CK) TAPS B/G; LWC	AC;GR; S9?		jafemrapCCCCSSauseocnode	176200 4800+00	U 05N 14E 07	A, B, E, F
37.46 131	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	197100 198500 1095+00	U 05N 14E 32	A, B, E, F
37.90 131	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS BG; LWC	AC? CN; GR		jafemrapCCCCSSauseocnode	200250 1077+00	U 05N 14E 03	A, B, E, F
38.55 131	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN; GR		jafemrapCCCCSSauseocnode	203320 1045+00 1042+00	U 05N 14E 03	A, B, E A, B, E, F
  131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; TAPS DOES NOT CROSS				 974+68	U 04N 14E 15	B, F
40.22 131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR;S9		JafemrapCCCCCCCCCCocnode	212225 957+00 952+94	U 04N 14E 15	A, E, F B, E
40.68 131	SAGAVANIRKTOK RIVER SIDE CHAN. (Ghost CK) TAPS B/G; LWC	AC?CN? GR;S9		jafemrapCCCCCCCCCCocnode	214525 937+70	U 04N 14E 16	A, B, E, F

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
40.80 131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC?CN? GR;S9		jafemrapCCCCCCCCCCocnode	215300 929+95	U 04N 14E 16	E
40.98 131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC?CN? GR;S9		jafemrapCCCCCCCCCCocnode	216100 924+58	U 04N 14E 21	B
41.16 131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	217275 905+50	U 04N 14E 21	A, B, E, F
41.39 131	SAGAVANIRKTOK RIVER TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	218525 893+50	U 04N 14E 21	A, B, E, F
41.77 131	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	220525 872+00	U 04N 14E 21	A, B, E, F
42.13 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	222500 853+25	U 04N 14E 27	B, E
42.25 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	223100 846+16	U 04N 14E 27	B
42.28 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	223150 843+08	U 04N 14E 27	B, E
42.54 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	224525 831+30	U 04N 14E 27	A, B, F

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
42.64 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	225075 826+50	U04N 14E 27	A, B, F
43.04 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	227200 804+68	U 04N 14E 34	B, F
43.71 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	230800 768+86	U 04N 14E 34	B
43.95 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	232075 756+49	U 04N 14E 34	B
44.34 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	234100 736+81	U 03N 14E 03	B, F
44.59 130	SAGAVANIRKTOK RIVER SIDE CHAN (Ghost CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCCCCCCCocnode	234950 728+68	U 03N 14E 03	B F
47.50 48.93 130 129	SAGAVANIRKTOK RIVER SIDE CHANNELS AND FLOODP (Extension CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSSCCCocnode	251000 258600 557+50 539+10 531+70 531+00 525+10 500+25 500+00 492+35 491+40	U 03N 14E 23 & 26	 A EF B EF B EF A E A E A E B EF B EF A E

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
49.90 129	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR; S9		jafemrapCCCCSSSCCeocnode	263950 437+00	U 03N 14E 35	B E F
50.07 129	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR; S9		jafemrapCCCCSSSCCeocnode	264600 430+00	U 03N 14E 35	A B E F
  129	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; DOES NOT CROSS				 414.20		A E
50.40 129	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR; S9		jafemrapCCCCSSSCCeocnode	266500 412+57	U 02N 14E 02	B E F
50.50 129	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; PARALLEL ONLY	AC? GR; S9		jafemrapCCCCSSSCCeocnode	NO TAPS XING 410+53	U 02N 14E 02	B E F
50.78 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	268000 396+00 395+41	U 02N 14E 01	 A E G B EFG
51.44 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	271700 360+60	U 02N 14E 12	B E G
51.56 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	272200 355+07	U 02N 14E 12	B E FG
52.16 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	275300 322+25	U 02N 14E 12	AB E FG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
52.97 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	279700 281+50	U 02N 14E 13	B E FG
53.12 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	280400 266+00	U 02N 14E 13	A E G
53.36 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	281600 265+76	U 02N 14E 13	B E FG
53.41 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	282000 258+61	U 02N 14E 24	B E FG
53.57 129	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	282800 246+28	U 02N 14E 24	B E FG
129	SAGAVANIRKTOK RIVER SIDE CHANEL TAPS B/G; DOES NOT CROSS				NO TAPS XING 242+80		B E FG
53.93 128	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR; S9		jafemrapCCCCSSCCCCocnode	284655 284704 233+50	U 02N 14E 24	B E FG
54.02 128	SAGAVANIRKTOK RIVER SIDE CHAN. (Wood CK) TAPS B/G; LWC	AC? CN? GR S9		jafemrapCCCCSSCCCCocnode	285185 285255 216+96 210+92	U 02N 14E 24	 B EFG B EFG
61.93 62.90 127	SAGAVANIRKTOK RIVER MAIN CHANNEL TAPS B/G; BLOCKPOINT	AC:BB; BW;CA; CN;CS DS;GR; HW?PS; RW;S9		SSSSSSSSCCCCSSCCCCCCSSSS	327000 *332329 1197+12 1143+83	U 01N 14E 26 & 27	AB E F

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
67.08 67.71 126	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; BLOCKPOINT	AC:BB; BW;CA; CN;CS DS;GR; HW?PS; RW;S9		SSSSSSSSCCCCSSCCCCCCSSSS	*354159 357500 933+28 897+87	U 01S 14E 22 & 23	AB E F
69.71 126	(Mark CK) TAPS B/G; LWC	AC;BB CN;GR; RW;S9?		jafemrapCCCCSSCCCCocnode	368058 792+00	U 01S 14E 34	AB E FG
69.77 126	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; BLOCKPOINT	AC;CN? GR;S9		jafemrapSSSSSSSSSSSnode	368400 791+00 790+40	U 01S 14E 34	 AB EFG F
70.36 126	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?CN? GR?S9?		jafemrapSSSSSSSSSSSnode	371500 ?	U 02S 14E 03	 I
70.51 126	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC;CN? GR;S9		jafemrapSSSSSSSSSSSnode	372315 ?	U 02S 14E 03	B E F I
70.54 126	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC;CN? GR;S9		jafemrapSSSSSSSSSSSnode	372450 747+12	U 02S 14E 03	AB F
70.72 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC;CN? GR;S9		jafemrapSSSSSSSSSSSnode	373400 ?	U 02S 14E 04	 I
70.81 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC;CN? GR;S9		jafemrapSSSSSSSSSSSnode	373875 734+30	U 02S 14E 04	AB E F
71.16 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?;CN? GR?S9		jafemrapSSSSSSSSSSSnode	375700 714+00	U 02S 14E 09	B E F I

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
71.45 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; CMPs	AC?;CN? GR?;S9?		jafemrapSSSSSSSSSSSSnode	377250 698+26 697+50	U 02S 14E 09	 I AB E B EF
125 APL/AMS-4 SAGAVANIRKTOK RIVER SIDE CHANNEL							B
71.55 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC?;CN? GR?S9?		jafemrapSSSSSSSSSSSSnode	377780 696+00 693+87	U 02S 14E 09	 I B F AB
72.06 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN? GR? S9?		jafemrapSSSSSSSSSSSSnode	380500 666+00	U 02S 14E 16	AB E F
72.45 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN? GR? S9?		jafemrapSSSSSSSSSSSSnode	382568 643+50	U 02S 14E 16	B F I
72.59 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN? GR? S9?		jafemrapSSSSSSSSSSSSnode	383268 637+00	U 02S 14E 16	B F I
72.68 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN? GR? S9?		jafemrapSSSSSSSSSSSSnode	383778 632+50	U 02S 14E 16	B F I
73.03 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN? GR? S9?		jafemrapSSSSSSSSSSSSnode	385607 616+70	U 02S 14E 16	B F I
75.34 125	SAGAVANIRKTOK RIVER SIDE CHANNEL (Spoiled Mary CK) TAPS B/G; LWC	AC; CN; GR		jafemrapCCCCSSCCCCocnode	397819 492+00	U 02S 14E 33	AB G

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
75.68 75.79 125	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	399600 400150 489+35 469+75	U 02S 14E 33	AB E F I
76.04 76.41 125 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; BLOCKPOINT	AC;BB; BW;CA; CN;CS; DS;GR; HW?PS; RW;S9		SSSSSSSSCCCCSSCCCCCCSSSS	401498 403455 463+00 446+00	U : U 02S : 03S 14E : 14E 33 : 4	AB E F
78.85 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	*416353 314+45	U 03S 14E 16	B F I
79.40 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	*419218 285+80	U 03S 14E 17	B F I
79.51 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	*419218 280+00	U 03S 14E 20	B F I
79.60 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	*420598 272+00	U 03S 14E 20	B F I
79.91 124	(Woody CK) TAPS B/G; LWC	GR		jafemrapSSSSSSSSSSocnode	*422115 256+83	U 03S 14E 20	AB E F
80.34 124	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? GR		jafemrapCCCCSSauseocnode	*424180 236+18	U 03S 14E 20	B F

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
83.25 84.22 123	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; BLOCKPOINT	AC;BB; BW;CA; CN;CS DS;GR; HW?PS: RW;S9		SSSSSSSSCCCCSSCCCCCCSSSS	*439572 444700 82+26 58+15	U 04S 14E 5, 7&8	AB E F
84.51 123	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS A/G; LWC	AC? GR?		jafemrapCCCCSSauseocnode	446158 446234 42+00 40+00 38+00	U 04S 14E 07	I B B B
84.93 123	(Dan or Charlotte CK) TAPS A/G; BRIDGE & 2 CMPs	AC;CN; GR;RW; S9	YES	jafemrapCCCCSSCCCCocnode 448439BRE448509 448509CMP448559 448679CMP448739	448439 448739 20+12	U 04S 14E 08	AB E FG
85.10 123	(Lori CK) TAPS A/G; LWC	GR		jafemrapSSSSSSSSSSocnode	459029 459099 1722+00	U 04S 14E 29	AB E FG
91.93 122	(Stump CK) TAPS A/G; LWC	CN;GR; LT;S9		jafemrapSSSSSSSSSSocnode	485366 485425 1499+00	U 05S 14E 16	B F G
92.19 92.36 122	(Clarke's Lake) TAPS A/G; Causeway & CMP	CN;GR; LT S9		CCCCCCCCCCCCSSSSCCCCCCCC	486739 487636 1489+28 1481+00	U 05S 14E 16	AB E FG
92.96 122	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS A/G; LWC	AC? CN; GR;RW; S9?		jafemrapCCCCSSSCCSSSnode	490853 490922 1445+25	U 05S 14E 21	A B F
93.36 122	SAGAVANIRKTOK RIVER SIDE CHANNEL TAPS B/G; LWC	AC? CN?; GR;S9		jafemrapCCCCSSSCCSSSnode	492917 492973 1424+79	U 05S 14E 21	AB E F
95.79 121	(Arthur CK) TAPS A/G; LWC	AC;BB; CN;GR		jafemrapCCCCSSSCCCocnode	505760 505825 1297+50	U 05S 14E 32	AB E FG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
96.12 121	(Gustafson Gulch) TAPS A/G; LWC	AC;BB; CN;GR		jafemrapCCCCSSSCCCocnode	507485 507550 1280+00	U 06S 14E 05	AB E FG
96.60 121	(Gustafson Gulch) TAPS A/G; DOES NOT CROSS	GR		jafemrapCCCCSSSCCCocnode	NO TAPS XING 1255+00	U 06S 14E 06	F
99.07 121	(Polygon CK) TAPS A/G; LWC	AC;BB; CN;GR		jafemrapCCCCSSSCCCocnode	523070 523145 1125+03	U 06S 14E 19	AB E FG
99.99 120	(Poison Pipe CK) TAPS A/G; LWC	AC;CN; GR		jafemrapCCCCSSSCCSSSocnode	527926 527986 1077+10	U 06S 14E 19	AB E FG
100.31 120	(Climb CK) TAPS A/G; CMP	AC;GR		jafemrapCCCCSSSCCCocnode	529599 529669 1060+34	U 06S 14E 30	AB E FG
100.81 120	(Dennis CK) TAPS A/G; LWC	AC;GR		jafemrapSSSSSSSSSSocnode	532280 532345 1033+60	U 06S 14E 30	AB E FG
100.89 120	(Bassett CK) TAPS A/G; LWC	GR?			532671 532738 1029+97	U 06S 14E 30	AB E FG
102.45 120	(Rudy CK) TAPS A/G; LWC	AC;CN; GR		jafemrapCCCCSSSCCCocnode	540899 540969 949+99	U 07S 14E 05	AB E FG
103.43 120	(Oksrukuyik CK) TAPS A/G; BLOCKPOINT	AC;BB; BW;CN; GR;RW?		jafemrapCCCCSSSCCCCCocnode	546161 546102 895+76	U 07S 14E 08	AB E FG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
104.57 120	(Margaret's Marsh) TAPS B/G; LWC	AC?GR? S9		jafemrapCCCCSSSCCCCCnode	552155 837+00	U 07S 14E 16	B F I J
113.52 119	(Thiele's Trickle) TAPS A/G; LWC	GR;		jafemrapSSSSSSSSSSSSocnode	599383 599438 1513+06	U 08S 14E 23	AB E F
114.86 119	(Shifish CK) TAPS A/G; LWC	AC?GR? DV		jafemrapSSSSSSSSSSSSnode	606434 606494 1441+40	U 08S 13E 27	B F I J
119 APL-1(Shifish CK)							B
115.76 119	(Shifish CK) TAPS A/G; LWC	AC?GR?		jafemrapSSSSSSSSSSSSnode	611203 611273 1398+20	U 08S 13E 28	B F I
117.06 118	(Oksrukuyik CK) TAPS A/G; BLOCKPOINT	AC;BB? CN;GR; LT;RW?		jafemrapCCCCSSSCCCCCnode	618290 618360 1323+71	U 08S 13E 32	AB E FG
123.92 117	TOOLIK RIVER TAPS A/G; BLOCKPOINT	AC;GR		jafemrapSSSSSSSSSSSSnode	654304 968+30	U 09S 12E 16	AB E FG
124.80 117	(East Fork KUPARUK RIVER) TAPS A/G; LWC	CN?GR		jafemrapSSSSSSSSSSSSnode	658915 658985 921+90	U 09S 12E 17	AB E FG
126.33 117	KUPARUK RIVER TAPS A/G; BLOCKPOINT	AC?CN; GR;LT?		jafemrapCCCCSSSCCCCCnode	666969 667043 842+00	U 09S 12E 19	AB E FG
127.04 117	(Holt CK) TAPS A/G; LWC	GR		jafemrapCCCCSSSCCCCCnode	670736 670806 804+36	U 09S 11E 25	AB E FG

Section MP / A/S	Stream Name(s) / Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
127.17 116	(Becky CK) TAPS A/G; LWC	GR		jafemrapCCCCSSSCCCCCnode	671416 671488 799+82	U 09S 11E 25	AB E FG
128.62 116	(Becky CK) TAPS A/G; LWC	GR		jafemrapCCCCSSSCCCCCnode	679066 679141 721+20	U 09S 11E 35	AB E FG
130.38 116	(Yan CK) TAPS A/G; LWC	CN?GR?		jafemrapSSSSSSSSSSSnode	688360 688420 629+00	U 10S 11E 03	B F I
132.95 115	(Moss CK) TAPS A/G; LWC	AC?GR?		jafemrapCCCCSSSCCCCCnode	701958 702028 494+00	U 10S 11E 23	AB E F I
115 APL-3 : (Terry CK)							B
133.48 115	(Terry CK) TAPS A/G; LWC	AC?GR		jafemrapSSSSSSSSSSSnode	704769 704839 465+91	U 10S 11E 23	AB E FG
134.01 115	(Mack CK) TAPS A/G; LWC	AC?;GR		jafemrapSSSSSSSSSSSnode	707537 707597 438+29	U 10S 11E 26	AB E FG
134.25 115	(Ed CK) TAPS A/G; LWC	GR?LT?		jafemrapSSSSSSSSSSSnode	708796 708855 425+79	U 10S 11E 26	B I
134.33 115	(Ed CK) TAPS A/G; LWC	AC;GR; LT?		jafemrapSSSSSSSSSSSnode	709205 709275 421+74	U 10S 11E 26	AB E FG
134.85 115	(Tributary Jill CK) TAPS A/G; LWC	AC?GR?		jafemrapSSSSSSSSSSSnode	711974 712034 394+50	U 10S 11E 26	AB E FG I

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
135.11 115	(Jill CK) TAPS A/G; LWC	AC?GR		jafemrapSSSSSSSSSSSnode	713343 713413 380+60	U 10S 11E 35	AB E FG
142.02 114	ATIGUN RIVER TAPS A/G; BLOCKPOINT	AC;BB; CN;GR; LT;RW		jafemrapCCCCSSSCCCCCSSSS	749548 750162 20+94	U 11 12 32	AB E FG
143.22 114	(Tee Lake Outlet) TAPS A/G; LWC	AC;BB; CN;GR LT;RW		jafemrapCCCCCCCCCCCCSSSS	756223 756293 155+29	U 12S 12E 05	A B CDE FG
141 143.28 114 114	(Tee Lake Outlet) TAPS AG; LWC	AC;BB; CN;GR; LT;RW		jafemrapCCCCCCCCCCCCSSSS	756523 756592 153+43	U 12S 12E 05	A B C DE FG
143.70 114	(Tee Lake Inlet) TAPS A/G; LWC	AC;BB; CN;GR; RW		jafemrapCCCCCCCCCCCCSSSS	758730 130+60	U 12S 12E 05	A B C DE FG
114 APS-2 (Tee Lake Inlet - CMP)							BCD
114	(Tad CK) TAPS A/G; DOES NOT CROSS	AC? GR?		DRAINS TO VANISH CREEK	NO XING 40+43	U 12S 12E 16	B F
145.67 114	(Vanish CK) TAPS A/G; LWC	AC;CN; GR;RW		jafemrapCCCCSSSCCCCCnode	769092 769162 35+80	U 12S 12E 16	AB D E FG
114	(Tributary Holden CK) TAPS A/G; DOES NOT CROSS	AC;GR		DRAINS TO HOLDEN CREEK	NO TAPS XING 31+59	U 12S 12E 16	B
145.76 114	(Holden CK) TAPS A/G; LWC	AC;CN; GR;RW		jafemrapCCCCSSSCCCCCnode	769595 769665 30+44	U 12S 12E 16	AB D E FG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
146.48 114	(Mainline Spring CK) TAPS A/G; LWC	AC;BB; CN;GR; RW		jafemrapCCCCSSSCCCCCnode	773367 773437 1227+00	U 12S 12E 21	AB D E F
147.39 114	(One-One-Three CK) TAPS A/G; LWC	AC;CN; GR;RW		jafemrapSSSSSSSSSSSSnode	778418 778478 1176+95	U 12S 12E 28	B D F
147.56 114	(Roche Mountonnee CK) TAPS A/G; BLOCKPOINT	AC;CN; GR;LT; RW		jafemrapCCCCSSSCCCCCnode	779139 779318 1168+75	U 12S 12E 28	AB DE FG
152.19 113	(Waterhole CK) TAPS A/G; LWC	GR		jafemrapSSSSSSSSSSSSnode	803507 803572 924+83	U 13S 12E 16	B D F
153.04 113	(One-Fifty-Three Mile CK) TAPS A/G; LWC	GR		jafemrapSSSSSSSSSSSSnode	808015 808068 885+24	U 13S 12E 21	B F
153.25 113	(Tyler CK) TAPS A/G; LWC	CN;GR; RW		jafemrapSSSSSSSSSSSSnode	809149 809209 882+00	U 13S 12E 21	AB D FG
153.33 113	(Tyler CK) TAPS A/G; LWC	CN;GR; RW		jafemrapSSSSSSSSSSSSnode	809558 809628 879+00	U 13S 12E 28	AB D FG
153.47 112	(One-One-Two CK) TAPS A/G; LWC	GR		jafemrapSSSSSSSSSSSSnode	810288 810353 871+00	U 13S 12E 28	B D F
153.59 112	(Tyler CK) TAPS A/G; LWC	CN;GR; RW		jafemrapSSSSSSSSSSSSnode	810947 811012 860+00	U 13S 12E 28	AB D FG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
154.12 112	(Trevor CK) TAPS A/G; LWC	AC;CN; GR;RW		jafemrapCCCCSSSCCCCCnode	813716 813786 837+00	U 13S 12E 28	AB E F
157.10 112	ATIGUN R. & FLOODPLAIN (One-Five-Seven Mile CK) TAPS A/G; LWC	AC;BB? CN;GR; LT?RW		jafemrapSSSSSSSSSSSnode	829563 681+00	U 14S 12E 07	AB E F
157.14 112	ATIGUN R. & FLOODPLAIN (Why Bother CK) TAPS A/G; LWC	AC;BB? CN;GR; LT?RW		jafemrapSSSSSSSSSSSnode	829715 678+30	U 14S 12E 07	AB E F
157.25 112	ATIGUN R. & FLOODPLAIN (Who CK) TAPS B/G; LWC	AC;BB?CN LT?RW		jafemrapSSSSSSSSSSSnode	830300 673+00	U 14S 12E 07	AB E F
157.25 165.45 112 111	ATIGUN R. & FLOODPLAIN TAPS A/G; LWC	AC;BB? CN;GR; LT?RW		jafemrapSSSSSSSSSSSnode	830300 639+50 634+00 628+00 625+00 622+26	U 14S 12E 07	 BD EF BD EF BD EF BD EF BD EF
					620+67 584+40 564+00 559+72 544+10	U 14S 12E 17	BD EF BD EFG BD EF BD EF BD EF
					537+80 536+41 534+68 527+00 523+00 502+90	U 14S 12E 20	D EF BD EF BD EF BD EF BD EF BD EFG

Section MP A/S	Stream Name(s) Comments	Fish Species	ADAD	Period of Sensitivity JaFeMrApMaJuJlAuSeOcNoDe	Field Station G-5	Meridian T R SEC	Reference
  111 110	ATIGUN R. & FLOODPLAIN TAPS B/G; LWC	AC?BB? CD?GR; LT?RW?		jafemrapSSSSSSSSSSSnode	497+73 495+40 481+62 480+60 476+45 467+35 461+52	U 14S 12E 20	BD EF BD EF BD EF BD EF BD EF BD EF BD EF
111 110	Continued ATIGUN R. & FLOODPLAIN	AC?BB? CD?GR; LT?RW?			454+56 450+67		BD EF BD EF
					428+42 410+00 409+25 386+00 377+00 373+60 368+00 350+00 347+50 299+00	U 14S 12E 32	ABD EF B D EF B D EF B D EF B D EF B D EF ABD EF ABD EF ABD EF BD F
					873550 242+00	U 15S 12E 18	BD FG